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MBNSION

ENTERING THE ODD WORLD OF SIDECARRING

here was a time in my motorcycling life that I was fond of repeating how a sidecar wrecks the dynamic pleasure of motorcycling, taking away the twowheeler's advantages over automobiles but without the safety, stability, or protection of a car.

I take it all back.

When last we had a Ural at CW HQ, I spent a lot of time on the thing on road and off and had a really good time after finally coming to terms with the strange dynamics of that heavy steel box hanging off of one side of a perfectly good motorcycle.

But the one thing that really flipped the weird switch for me was taking my young son, Ian, for a spin with his mom last spring. He was about a year old, so we just idled around the neighborhood. But he was instantly enthralled with the motion, grasping the stainless-steel grab handle in front of him and staring intently forward through the Ural's sidecar windscreen.

I recognized the nature of his vision toward the horizon, the set in his shoulders, and the pleasure he was enjoying in movement. We motored up the road a way and looped back at the dead end in the canyon where we live. When I pulled back through the gate in the yard, I spun the Ural around and came to a stop in front of the porch. I let the bike idle for a second, absorbing the moment and enjoying his obvious pleasure with the experience. It was dusk, so I shut off the bike. And Ian wailed like he rarely ever does, turning bright red and tipping his head back as if crying to the gods of speed in the heavens.

So I restarted the bike, and he stopped crying at once then reached back out for that shiny stainless grab handle and cast his bright, teary eyes forward once more. I clicked into gear and we were

off for a repeat performance. The other parents in the neighborhood walking the kids in strollers and other inferior forms of transport were visibly envious, as were their poor children who never had known, and may never know, such

It was clear there was a sidecar in the future for us.

As much as motorcycling has been an individual pursuit in my life, this moment in the three-wheeler set me, in an instant, on a mission to make at least some parts of motorcycling more of a family affair. My wife, Jen, and I have traveled extensively by motorcycle, and she's also a fine rider in her own right. Adding our son to the mix was magic.

Ian is two years old now and has a good-fitting helmet and an ever-growing love for vehicles, from motorcycles to cars to aircraft.

Running full time in the circles I do with every kind of motorcycle enthusiast, collector, and athlete. I was bound to find just the right chair to bolt to the side of my '54 Velocette MSS, a natural candidate since the factory frame is set up with sidecar lugs. I recalled a Swallow Jet 80 sidecar lying fallow in collector and Vincent specialist Herb Harris' Austin shop, the Harris Vincent Gallery. I called him up, he admired the idea of extending family fun in fine style, and we struck a deal.

The Swallow sidecar is a thing of beauty, but the extra attraction for me is that the company was originally founded by Sir William Lyons and morphed into Jaguar Cars, Ltd. So the Swallow will join the E-type and Mark 2 in the garage, a historically relevant relic that was, as period adverts said, "for the sportsman." Parking is an issue, but my hope is that we rarely stop moving.

MARK HOYER **EDITOR-IN-CHIEF**





1954 LIKELY YEAR OF MY "NEW" **SWALLOW JET 80 SIDECAR**



PROJECTED TOP SPEED IN MPH OF VELOCETTE 500 WITH CHAIR

.....

YEAR OF THE ELECTRONIC MOTORCYCLE, FROM YAMAHA, DUCATI, AND KTM





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Intake

KICKSTART THE CONVERSATION



Well, I'm 64 years young, and the Ducati Scrambler appeals to me. In '74 when I bought my first GT750, it appealed to me, and I didn't care what others thought about it. Motorcyclists don't need to be told what is cool. We know. Either you get it or you don't. Now, can I afford a Scrambler along with my 2011 796M? And no, I still don't care what others think. My main ride is a '72 Shovelhead.

MICHAEL PORTAGE

CYCLEWORLD.COM

LACE 'EM UP

As a CW devotee for more than 30 years, I'm compelled to write *Intake* for the first time. The March 2015 issue fires on all cylinders, especially the "World's Coolest Bikes" feature and the excellent Race Watch on the Superprestigio. High-quality motojournalism not withstanding, the excess of floppyshoelaced riders stumped me like an inexplicably persistent false neutral! Hipster trendy or not, floppy shoelaces have no place on a cyclist's feet. I only had to see it once-riding buddy splitting lanes ahead of me comes to a stoplight, puts his right foot down, hooks the shoelace loop on the peg or brake lever, and falls over into the side of a new Cadillac.

> ERNIE SALLE MILPITAS, CA

As my wife handed me the March issue, she took one look at the cover and commented: "Didn't they teach us in that MSF course we took years ago that it was

unsafe to ride with just tennis shoes? I replied that these had the new "safety laces." I don't think she believed me.

CHRISTO RUSH
CYCLEWORLD.COM

COOL FACTOR

Did it ever occur to anyone that the "new urban rider" may not want (or be able to afford) all the responsibilities and burdens of new bike ownership? A good measure of the "coolness" factor is taking something cast off and cheaply converting it to one's own design and use. Wasn't this the original idea behind the first bobbers of long ago?

RICHARD CREED BELTON, TX

GIVING THANKS

The Easy Rider story ("Where Has My Easy Rider Gone?" March) hit home on so many levels. Nancy and I were involved on the front row of Civil Rights in the Deep South in the '60s. We knew the characters/teams at SNCC (Student

Nonviolent Coordinating Committee), the Freedom Schools Program, the Ford Foundation, working to get all of the traditional Black Colleges accredited. I ran the Ford Foundation program and had many run-ins with unhappy Southerners and felt their wrath more than once. Paul d'Orleans' story on the Captain America bike was extraordinary journalism, and the final paragraph was brilliantly written. Thank you for busting the myth and showing another part of American history accurately and succinctly. I am left wondering why Peter Fonda did not end the false myths and give credit where it was due until December 2014? What demons has he been fighting?

> HOWARD YANA-SHAPIRO CYCLEWORLD.COM

I've been subscribing to Cycle World for, oh, decades now. It's always been a modest read: what's new with motorcycles and how to fix them. Imagine my surprise in the March issue when I see an article on the real story behind Easy Rider. Excellent job. For a while I thought that I was reading the latest Smithsonian.

ROBERT ERCK CYCLEWORLD.COM

ICONIC HIPSTERS

Please, please stop using the word "hipster"—at least when referring to motorcycles I may buy someday, such as the Ducati Scrambler. I see you've managed to eliminate "iconic." Good start. For heaven's sake, I beg you to make "hipster" (I cringe just writing it) the next to go!

BRAD JARVIS CYCLEWORLD.COM



Comments? Suggestions? Criticisms? Write us at **intake@cycleworld.com**.



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MILLISECONDS:

Time it takes for Aprilia Dynamic Damping to switch from full hard to full soft (that's one-hundredth of a second). 690

WATTS: Amount of electrical power produced by the 1200 Rally's alternator at 6,000 rpm. Heated vest? Nav system? No problem.

CW FIRST RIDE

BY THE NUMBERS

2015 APRILIA CAPONORD 1200 RALLY

At last, an ADV version of the Caponord

By Andrew Bornhop

ome June, the new 2015
Aprilia Caponord 1200
Rally arrives in the US. It's the ADV Caponord, fitted with tubeless wire-spoked wheels (17-inch rear, 19-inch front) and standard adventure hardware that includes tubular crash guards, large 33-liter side cases, an engine skid plate, auxiliary LED lights, and a taller manually adjustable windscreen. Aprilia has also tuned the TC and ABS to work better in the dirt.

I recently rode this \$15,695 machine on Sardinia, mostly on grippy tarmac but also on a couple of easy dirt sections. My quick take? I'm impressed. The Caponord 1200 Rally is fun and totally at home on the sinewy roads. The chassis is outstanding, and the 1,197cc four-cam 90-degree V-twin puts out plenty of power, aided by a new Helmholtz resonator in the exhaust that improves low-end and midrange power.

Could I feel this improved power? Not really. The 1200 Rally just felt strong, able to pull hard without protest from low rpm and occasionally even loft its front wheel when I was hard on the throttle and upshifting with the precise six-speed gearbox.

Because of the larger new front wheel, Aprilia altered the front

geometry to keep the handling as close as possible to that of the standard Caponord. As such, the Rally bends into corners with a natural ease and good clearance while staying composed under power on the way out. Grip from the stock Metzeler Tourance Next tires—size 120/70-19 front, 170/60-17 rear—is excellent. Via changing the offset of the triple clamps, Aprilia has increased steering rake to 27.4 degrees (from 26.1) and shortened trail to 4.6 inches (from 4.9). A simple look at the front axle reveals how Aprilia moved the axle forward a bit to reduce trail.

As on the standard Caponord, the new 1200 Rally has a ride-by-wire throttle with Touring, Sport, and Rain settings, the last cutting engine output to 100 hp to (from a claimed 125) for added safety in the wet. I spent most of the







52-liter top box



Tank bag

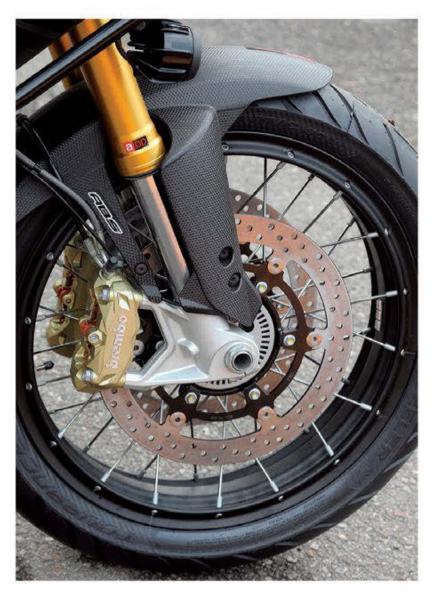


Oversize foot for sidestand hase



Off-road footpegs

A quick study of the accessories underscores that Aprilia sees its new 1200 Rally as a long-distance adventure. Most prominent? The huge 52-liter top case, which will hold two full-face helmets. But there are also soft bags, a larger foot for the sidestand, plus off-road footpegs that make it easier to stand while riding in the dirt. We like.





Big radial Brembos with braided lines are on duty up front, where the axle has been pushed forward a bit to reduce trail. Note how the spoke nipples attach to the flanged outer edges of the rim. With Aprilia's Multimedia Platform, your iPhone (below) turns into an instrument panel that displays all kinds of fun data, including lean angle. The bike will even tell you how far it is to the famed North Cape in Norway. Let's go!



day in Touring because Sport felt too sensitive, too abrupt. Similarly, the traction control has three levels. Map 1, though, has a new double threshold of intervention that allows more wheelspin for added control (and fun!) in the dirt.

Besides the excellent chassis and stout motor, what impressed me most about the Rally is its Sachs electronically controlled suspension, which has automatic damping control and four electronically adjustable rear preload settings. I rode most of the day in the automatic preload setting, and the constant stream of damping adjustments felt completely transparent, evident only in the remarkable composure of the bike as it glided through dips or was flicked through chicanes.

With its wide handlebar, well-padded seat, upright ergonomics, and generous 6.3-gallon fuel

tank, the new Caponord Rally is a comfortable bike with a claimed dry weight of 525 pounds. While that's heavy, it's more than 50 pounds lighter than a BMW R1200GS.

Are we implying that this Italian is in the same ADV league as the big

Beemer? No, it's way too early for that. But there's no denying that it's been transformed into a much more formidable ADV competitor. Time to spoon on some Continental TKC80s and see how this Italian machine works in the dirt!



APRILIA CAPONORD 1200 RALLY

ENGINE TYPE
DOHC V-twin

DISPLACEMENT

SEAT HEIGHT

FUEL CAPACITY

CLAIMED DRY WEIGHT

PRICE \$15,695

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2015 ZERO SR Drinking the electric Kool-Aid By Brian Catterson

hen Cycle World asked if I would attend the 2015 Zero Motorcycles press introduction, I said yes before I'd really thought about it. Aside from a few parking-lot hot laps, the last Zero I'd spent significant time on was the MX off-road model circa 2008. So the depth of my experience with electric bikes is admittedly shallow. But maybe that sort of detached perspective is what's required to adequately judge the genre's progress...

In 2013, the model range was completely redesigned using a sustainable platform of three to four lithium-ion battery modules, nicknamed "bricks,"

housed in one box, called a "monolith" (a nod to 2001: A Space *Odyssey*). Each of these bricks is made up of 28 battery packets that are daisy-chained together before being sealed in to ensure watertightness and to prevent damage from vibration. An optional supplemental battery module, called a Power Tank, can be installed to boost range.

After sampling the FX, S, and DS models, we spent a full afternoon riding the hot-rod SR in the redwood forests surrounding the famed Alice's Restaurant south of San Francisco. On those tight and twisty back roads where a

conventional motorcycle rider would leave the transmission in one gear and surf the waves of torque, the SR felt pretty normal. It's eerily smooth, and there's a bit less engine-braking, but dial up the regenerative braking level via the smartphone app and it feels even more so.

While there's no mistaking the SR for a sportbike, it is certainly sporty. You won't set any records in the quarter-mile, and wheelying is out of the question, but with a claimed 106 pound-feet of torque and a top speed just north of 100 mph, the Zero SR is definitely not slow! Steering is relatively light









LIGHTNING LS-218 Two-wheeled Tesla.



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and neutral, but run it into a corner a little too hot, grab some more brake while leaned over, and you'll feel every one of its claimed 452 pounds.

One of the key changes to the 2015 Zero model line is new brakes from Spanish company J.Juan working with a carrier-less 320mm front rotor. These work wonderfully, with predictable feel and only some slight lever/pedal pulsing when the now-standard Bosch ABS kicks in. The new cast-aluminum wheels shod with Pirelli Diablo Rosso II radials are similarly praiseworthy. But while the new fully adjustable Showa suspension is said to be a big improvement, I found the ride on bumpy roads left something to be desired. The suspension on the long-travel DS worked noticeably better.

Range is still the Achilles' heel of electric bikes, but it is improving. We did 80 miles on our SR testbikes (fitted with Power Tanks) and still had close to 10 percent power remaining. And that was mostly spirited riding in Sport mode; toggle back to Eco mode and you could increase that distance considerably. Recharge time is



also something to consider: Plug the SR into a 110-volt wall outlet and it will take a good 10 hours for its battery to replenish—or less than half that with the \$600 accessory Quick-Charger.

The one other issue is cost. The SR retails for a jawdropping \$17,345, not including the \$2,495 Power Tank. Even allowing for never having to buy gas or pay for maintenance. that's expensive, putting the SR in the same price bracket as motorcycles with far more

impressive performance. But as Zero's VP of Global Marketing Scot Harden said, "Imagine if vehicles had been electric all along and someone introduced a gasoline engine today. Do you think it would catch on?" No, probably not. There's a lot of electric Kool-Aid being drunk at Zero, but spend some time riding one and you'll see why its supporters are so high on them. So pass me a glass—it may be an acquired taste, but this stuff's not half bad! [W]



2015 ZERO SR

PRICE:

(as tested): \$19,840

MOTOR:

brushless, high-temp magnet

MAX BATTERY CAPACITY:

14.2 kWh

SEAT HEIGHT:

31.8 in.

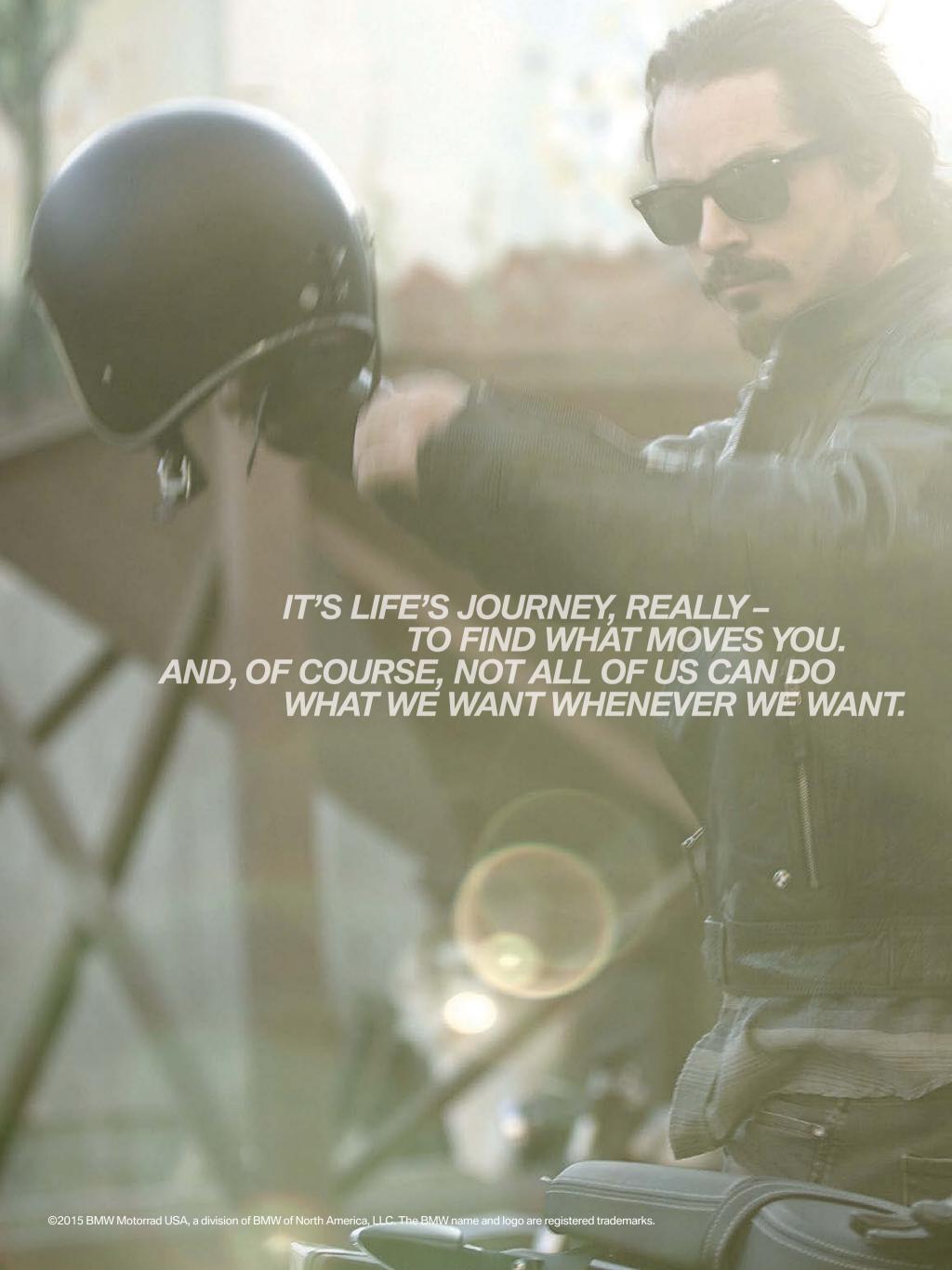
CHARGING TIME:

standard current: 9.9 hours

CLAIMED WEIGHT:

452 lb.





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CW FIRST RIDE

2015 STAR BOLT C-SPEC

A jolt of caffeine **By Don Canet**



S

ince their debut two years ago, the Star Bolt and Bolt R-Spec models have hit the top of the sales chart for Yamaha's cruiser brand. And with current sales at 141 percent of last year's, it's clear there's increasing demand for the air-cooled, 942cc, 60-degree V-twin. The new 2015 Bolt C-Spec is certain to broaden further the platform's appeal with café-inspired ergos and styling.

The powertrain remains unchanged from that of the base and R-Spec models, as does the double-cradle frame, 3.2-gallon fuel tank, steel fenders, 12-spoke cast wheels, and wave-style brake rotors. The parts that lend the C-Spec its café racer look and feel begin with cast clip-on bars that position the hands a good 4 inches forward and a couple of inches lower. The footpegs have been shuffled 6 inches rearward and 1.25 inches higher, while a reshaped and more thickly padded saddle with a removable solo seat cowl completes the classic café rider triangle. The Bolt's familiar LCD instrument pod has also been fittingly repositioned atop the triple clamp.

The C-Spec doesn't rely on looks alone

as it rails the curves between home and coffeehouse. It has a sportier stance thanks to the 41mm KYB fork having 9mm-longer tubes sheathed in classic rubber boots, plus preload-adjustable piggyback KYB shocks that have been lengthened 6mm. Ride height has increased 1.6 inches for an improved 37 degrees of cornering lean (Standard Bolt: 33).

I spent a day aboard the C-Spec and found that it offers the same perfect fueling and smooth, easy-to-manage power delivery as I remembered. The seat is very comfortable and slim enough to negate the higher 30.1-inch height. Handling is natural and very stable, supported by a ride that soaks up all but the harshest bumps. The single disc front brake provides enough power to howl the tire.

If the original Bolt was accused of targeting the ubiquitous Harley-Davidson Sportster 883, then, by Star Motorcycle's own admission, the new 2015 C-Spec takes direct aim at Triumph's similarly themed Thruxton. Star, though, feels that it has the competition covered in price, performance, comfort, and convenience.

I say this calls for a race to the café.

SPECS

2015 STAR BOLT C-SPEC

PRICE:

\$8690

ENGINE:

air-cooled 4-stroke, V-twin, SOHC, 4 valves per cyl.

DISPLACEMENT:

942cc

SEAT HEIGHT:

30.1 in.

FUEL CAPACITY:

3.2 gal.

CLAIMED WET WEIGHT:

542 lb.

22 CYCLE WORLD MAY 2015 PHOTOGRAPHY BY Brian J. Nelson

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KENJI EKUAN, 1929–2015

This industrial designer brought us the V-Max—and much more

By Kevin Cameron



Born in 1929, Ekuan formed strong images of war's destruction of human creations. His father died of radiation exposure from the atomic bombings. Ekuan at first devoted himself to the purely spiritual as a monk but found himself attracted to the "speech" of shapes and objects. He graduated from Tokyo National University in 1955 and then from Pasadena's Art College of Design in 1957. He wanted to gather to himself the styles of all the world's cultures in order to discover a language of form. Also in 1957 he founded his design group.

Every account of his life speaks of his 1961 design of the classic red-topped Kikkoman soy sauce dispenser, but he and his firm were busy in every area of design. In

the GK Dynamics book Spirit of Yamaha Motorcycle Design, he speaks of "Man-machine soul-energy," which is the creative relationship between human being and the extensions-of-self (tools) we build.

Here in the West it is hard to know what to make of such things—of phrases like, "The soul of the machine rejoices, and we are also overjoyed"—but we are more able to understand his shapes. One of these is the Yamaha V-Max motorcycle of 1985 (and

of the current Star VMAX), described as "brute macho." Big convex castings, massive shapes. They do speak, whether we consciously "listen" or not.

Yet in the same book are the spare functional lines of the YZ608 of 1967— what American racers came to know as the Yamaha TR-2 350 roadracer, a true giant-killer. The GK Design book says of this, "...the ultimate purity of Yamaha racing technology is unified with the GK minimalist design mind as the starting point of motorcycle design. Again and again, the simplification necessary for success in racing became the basis for production designs."

Ekuan sought the "democratization of goods and beauty" to make pleasing objects "accessible to everyone."

Volumes have been written about "minimalism" in the arts, but in industrial design it has a concrete meaning. Simple effective objects are easier and cheaper to build, ensuring that more users can benefit from them. In racing as in aerospace, we know that the fewer parts there are, the less likely failure becomes. Nature, with a billion



years of experience, is economical. So must we ourselves be. As machines evolve, they gain weight and complexity from added improvements. Yet at some point, someone must reverse this rush to complexity by having a simplifying idea that achieves the chosen goals more directly.

Ekuan's Komachi bullet train looks very much like the French TGV ("train of great speed") and so it should; both do the same job, just as do F-15 and Sukhoi-27 fighters.

Engineers are often suspicious of beauty, regarding it as an afterthought, a "cover" added by marketing after the real creative work is finished. Even so, they (and we) need to be reminded that most beautiful of all is rightness of basic design—form that arises only from suitability for purpose. John Britten, asked about the separate aesthetics of mathematics, circuit-board layout, or photography, said, "If only we could know enough, I believe we would find that there is a single aesthetic, unifying them all."

Others will continue Kenji Ekuan's work toward this goal.



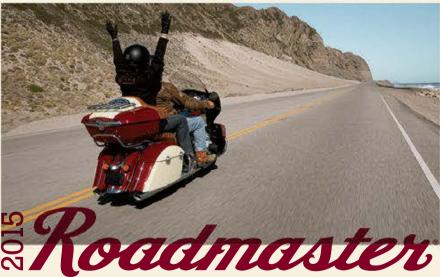






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GIANT LOOP PRONGHORN STRAPS

The best way to attach things to your motorcycle

→ If it's the simple things in life that make you happy, you're going to love Pronghorn Straps from adventure luggage and equipment company Giant Loop. Its motto is, "Go light. Go fast. Go far." and these reusable, lightweight, rugged straps are magnificent when it comes to quickly and easily securing just about anything to your motorcycle. Giant Loop claims there are a million uses, but did it count securing a surfboard or camera-mounted tripod to a liter-plus adventure bike for a 1,200-mile Baja adventure? Make it a million and two uses, at least. The super-tough stretch polyurethane straps come in three sizes and have proven to be indestructible and infinitely more useful than bungee cords. These beautiful little straps are now standard equipment in both my off-road kit and camera bag. –Jeff Allen





→ 16-, 20- & 26-in. lengths

→ giantloopmoto.com















THE MOST POWERFUL MOTORCYCLE BATTERY

GYZ32HL 500 CCA 32 Ah



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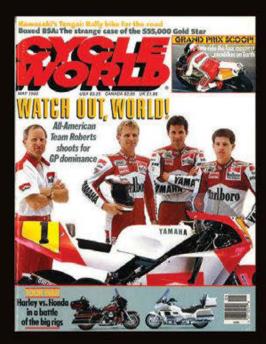
- More Amp hours for more accessories
- Factory activated, AGM, maintenance-free
- Large heavy-duty flush terminals with multiple connections and built in brass nuts (GYZ32HL, GYZ20H, GYZ20HL)





MAY 1990





→ Watch Out, World! That warning adorned an unusual cover featuring Team Roberts and its all-star lineup: manager Kenny Roberts and 500cc riders Wayne Rainey, Eddie Lawson, and 250cc rider John Kocinski. For the 1990 season, Roberts built a super team. In addition to bringing thencurrent 500 GP champ Lawson into the fold, Team Roberts retained runner-up Rainey and secured a Marlboro sponsorship package. Almost

as important, they got coveted Michelin tires. At season's end, Rainey secured the 500cc title and Kocinski the 250cc.

→ An accompanying story to the Team Roberts feature was our European Correspondent's post-season sampling of the four 1989 factory Grand Prix machines, including Lawson's championship-winning Honda NSR500, Rainey's Yamaha YZR500, Kevin Schwantz's Suzuki

RGV500, and Randy Mamola's Cagiva V589.

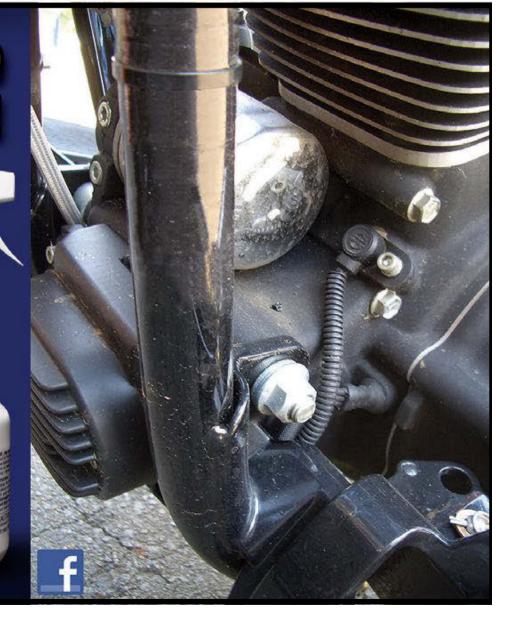
→ Need proof that today's ADV bikes have been honed for decades? A test of Kawasaki's Tengai shows that even the Japanese had their eyes on this market a long time ago. Based on the KLR650, the Tengai had a fairing and windscreen à la Dakar-style bikes and shorter suspension travel to improve its street chops.

–Blake Conner

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ON THE RECORD

ABE ASKENAZI

Zero Motorcycles' CTO explains everything you ever wanted to know about EVs—and then some **By Brian Catterson**

BATTERY CELL DEVELOPMENT IS THE WILD WILD WEST. Unless you're packing the little cylindricals that are used in laptops, there really are no size or shape standards. Cylindricals look like AAs; they're called 18650s because they're 18mm in diameter and 65mm in length. There are two issues in creating a pack with cylindricals: volumetric efficiency and thermal management. Liquidcooling complicates things. Also, it needs to be a very large pack. Tesla uses 18650s, but motorcycles are not cars; we don't have the real estate. The other thing about cylindricals is they're metal cans that you have to weld interconnect tabs to, and that's difficult from a durability standpoint. The Fisker A123 fiasco was due to poor management of these welds.

→ MOST POWERSPORTS EQUIPMENT IS BASED AROUND FIELD-EFFECT TRANSISTOR (FET) TECHNOLOGY, WHICH PEAKS AROUND 130 VOLTS.

When you go to higher voltage, you have to go to Integrated Bulk Data Transfer (IBDT) technology. The car guys are at 300 to 400 volts, which, incidentally, the Harley-Davidson LiveWire is 300 volts. But at the level of power that a motorcycle makes, the difference is not that impactful. It's also a safety issue: Our manufacturing is pretty high-end, but we don't have automotive levels of safety, and we can't guarantee that every dealership is going to have high-voltage safety systems in place. The standard for powersports and industrial equipment, such as forklifts, is 102 volts, which if you screw up, will shock and hurt you but isn't fatal. If you get shocked with a 300- to 400-volt battery, you're dead.

→ FOR LITHIUM-ION CELLS, NOMINAL VOLTAGE IS 3.65 VOLTS. We use pouch cells, which



THE
CONTROLLER
IS LIKE THE
EFI OF AN
INTERNALCOMBUSTION
VEHICLE.
IT BASICALLY
SUCKS

ENERGY
OUT OF THE
BATTERY
AND
METERS IT
TO THE
MOTOR,
WHICH
PUTS THAT
ENERGY
INTO DRIVING
THE VEHICLE
FORWARD.**

look like manila envelopes with little tabs sticking out the end. If you put 28 of these in series, you get 102 volts. So our cell box, what we call a "brick," has a stack of 28 of these things in intimate contact with one another. From a volumetric and thermal standpoint, it's the most efficient pack you can have. As for the interconnects, we use mechanical crimps and then pour in a very special compound, a form of polyurea, that casts the whole thing in stone to protect it against vibration and weather.

→ YOU DON'T ACTUALLY GET 100-PERCENT **TORQUE ALL THE TIME.** There's a position sensor on the motor that tells the controller where it's at. To get the thing spinning, there's a lot of information going back and forth. So it takes a little bit to be able to deliver full wattage. And then you are at maximum torque, but at higher speeds you have this thing called back-EMF (Electromotive Force). The motor starts fighting itself because it wants to become more of a generator than a power-producing thing, and torque starts dropping. So there is a range from around 50 to 4,000 rpm where you are at maximum torque. **E**

Complete interview on cycleworld.com

ZERO



Fast on its Fleet

→ Zero has quickly become a world-wide provider of military and police vehicles. The city of Bogota, Colombia, is the biggest customer with 100 units, followed by Hong Kong with 60. The Philadelphia Fire Department recently bought five bikes.

CHAdeMO

→ In 2010,
Japanese engineers created a
standard for rapid electric-vehicle recharging called CHAdeMO, which Zero embraced.
Unfortunately,
America's SAE developed a standard of its own that doesn't work with Zero's batteries.

Four-Wheeled Fun

→ Zero offers its electric powertrain for sale separately, and so far the only project that has come to fruition is with its Northern California neighbor, Rattlesnake Karts. Given the growing popularity of indoor go-kart tracks, this is a potentially huge market.



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9-liter bag designed for
ADV riders who want to
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New to the dirt-track market are **Metal-sports' FlatTrack wheels** (\$2,100/set), available in two standard finishes: black anodized or polished. The wheels are machined from billet forgings, have 25mm bearings, and are available in four rear widths and three front, with multiple hub sizes and available custom builds and finishes.

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HAND CONTROL

Do you sometimes

feel like you're lacking throttle control? Maybe it's your bike. **G2's Street Tamer Throttle Tube** (\$79.95) mellows throttle inputs by providing a nonlinear ratio between the throttle tube and your throttle body or carburetor. This allows better control while improving the jerky off-idle response typical of some EFI bikes.

→ (815) 535-3236 g2ergo.com



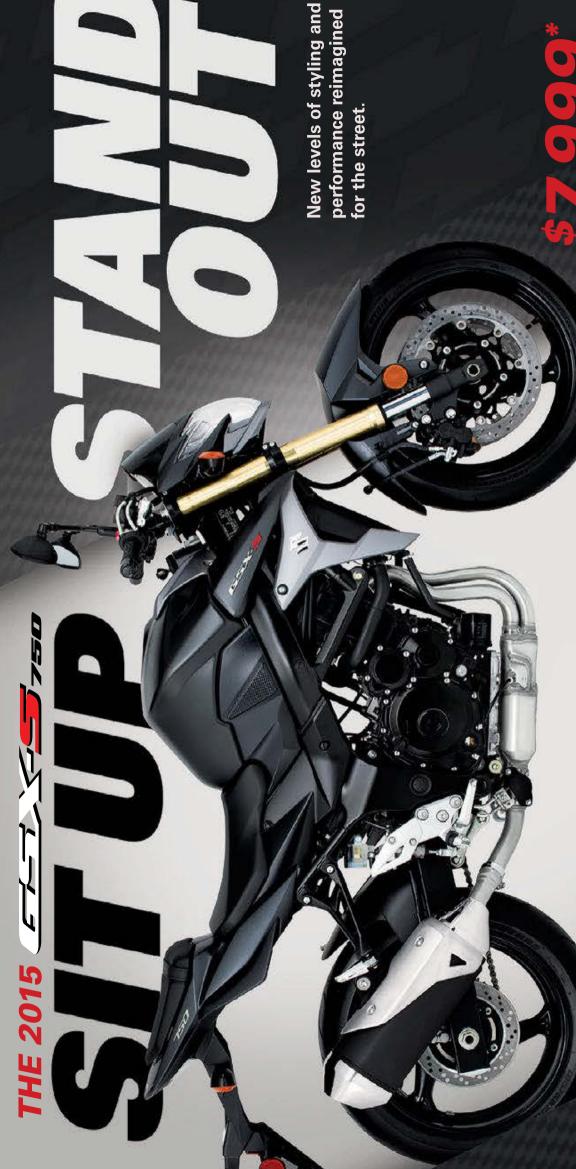
HEAT HATER

If you want to stay protected but hate roasting in a dead cow skin in the summer heat, IXS's Andover mesh jacket (\$169) and Archer pant (\$149) offer massive ventilation to keep you cool on your ride. Safety comes in the form of Level 1 shoulder, back, and elbow pads, while two external and two internal pockets provide storage.

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CW EVALUATION

SCORPION YUKON TEXTILE SUIT

Top-shelf features at a happy-hour price By Blake Conner



SCORPION XDR YUKON JACKET & PANT

scorpionusa.com

PRICE: JACKET \$549.95-\$564.95; PANT \$359.95-\$374.95

UPS

- Excellent price considering features
- Great comfort and fit
- Effective waterproof/ windproof shell

DOWNS

- Armor floats around in their pockets
- Not best airflow on very hot days
- Order Tall if you don't want "high-water" look while seated

hen it comes to motorcycle-apparel functionality, textiles simply can't be beat. Although it took a while for the motorcycle-apparel makers to catch up with the ski and backpack industries, we're now seeing a wave of new high-tech fabrics and features employed to protect riders.

And of all the riders, adventure-tourers might be the toughest to please because their suits must offer exceptional features while being comfortable in a broad range of climates and terrain.

Scorpion's new Yukon jacket and pants do just that. For starters, they offer an Exo-Dry waterproof breathable laminate shell that allows the rider to layer underneath for warmth (less-expensive three-layer gear requires zipping in a waterproof membrane and an insulated liner). All Yukon seams are windproof, waterproof, and sewn with Scorpion's Exo-Stitch, so they won't blow apart in a crash.

Having worn this suit in a variety of weather conditions—from the rain and near-freezing cold of Mount Etna in Sicily to the heat of the Canary Islands—I can attest to its range of comfort and functionality.

Getting the jacket zipped takes a few extra seconds, as it's fitted with a Sas-Tec CE-certified chest protector that Velcros in and needs to be positioned. Additionally, back, elbow, and shoulder

protection are included. For off-road riding, you can secure the built-in kidney belt that tucks away when not wanted. A removable turtleneck collar can be zipped off for warm temperatures, while vents along the arms, under the armpits, back, and shoulders help move air effectively.

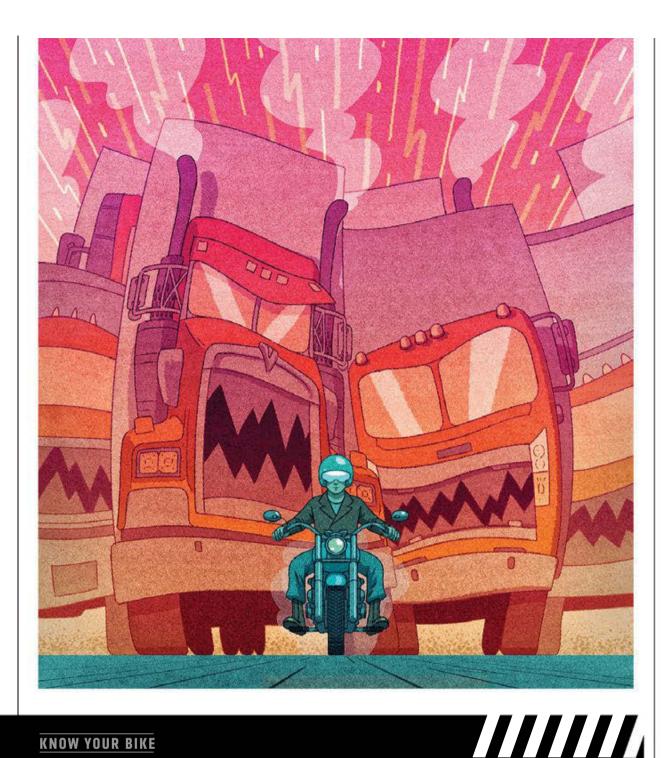
Pockets and storage are ample; the jacket has nine external (four of which are waterproof and can accommodate a smartphone) and four internal pockets, including a hidden passport pocket. The pants have four external pockets and a hidden money zip in the waistband.

Jacket comfort and fit were excellent; adjustment straps at the waist and on the arms enabled me to fine-tune the fit, and the leather-piped collar felt soft against my skin. With good ventilation, I've been able to keep fairly cool when wrestling bikes off road, but the Yukon sacrifices massive frontal vents for the sake of waterproofing. Layering underneath with a vest, fleece, or heated garment gives this jacket four-season range.

The pants feature Velcro waist straps to optimize fit, and the inner calves are covered in leather for good wear and heat resistance. I just wish I had ordered the Tall version so the legs would cover my boots when seated.

My final assessment: If you are going to spring for high-quality ADV gear, Scorpion is now a serious player with features and quality that typically come with a much higher price tag.





KNOW YOUR BIKE

BACK OFF, JACK

For when you need eyes in the back of your head **By John L. Stein**

ike most warriors, I'm extremely confident going forward, able to respond to conditions and situations, opportunities, and threats instantly and instinctively. Bring 'em on! But what scares the bloody hell out of me is not what's up front but what's behind me, unseen and totally out of my control: aggressive tailgaters in SUVs, that beat-up gravel truck that is desperately trying to stop for the traffic light where I'm already sitting, and sometimes even the cunning local

constable out hunting for throttle jockeys.

Chopper rats, tourers, sport riders, and supermotoers—we may bag on each other's rides, but we all need protection from the rear. So on your behalf, I went to the local highway patrol office and asked if there are a significant number of accidents wherein motorcyclists are rear-ended. "Not really," the PIO said with a shrug. And yet, it does happen. An amigo took an unwanted trip to coma-land after being rear-ended at an intersection; another had his ride

punched right out from under him at a red light. And seeing rear-fender benders on the freeway is common. Let's just not let it be common for us, lacking as we are crumple zones and whiplash restraints.

So herewith are four strategies for protecting our tails. Will they always work? Certainly not. But if just one of them works one time, it'll have been worth doing.

- 1) El mirrors grande. What you can't see, you can't escape. So make sure you've got two good mirrors that give you a nice full rear view of following traffic, rather than just your shoulders, jacket sleeves, or the ground. A good strategy: Adjust one of your mirrors so that you can see what is directly behind you, even if it means adjusting your viewing angle to it while merging on that side.
- 2) Tailgate abate. Tailgaters will often respond to quick flashes of a brake light (don't brake check 'emthat's asking for trouble) or extending your left hand to say, "back off." If neither works, get away-you can't win this fight.

3) When in doubt, modulate.

A brake-light modulator like the one from Signal Dynamics (signaldynamics.com) can attract attention from distracted drivers



and not just during braking. Lightly dragging the brakes sprays a nice little burst of pulsating red light rearward anytime you need it.

4) Look alive. You've got nearly 180 degrees of forward and peripheral vision and none to the rear. The best strategy here is to avoid complacence. Scan your mirrors constantly for bogeys at six o'clock.



4TH AGE OF MOTORCYCLING

FROM FUNCTION TO FASHION, AND BEYOND BY PAUL D'ORLEANS

s the 20th century stumbled over Wo<mark>rld War II, a new kind</mark> of motorcycle took root in the US, and we're still grappling with the implications. In the mid-1940s, pioneering artist-bikers modified their Harleys, Indians, and Brit-bikes not for performance but for style. While bob-jobs had hit the streets by the mid-'30s, mimicking Class C racers, by the decade's end a few riders added wacky pinstriped paint jobs, flashy chrome, upswept exhausts, and high handlebars to their bob-jobs. There isn't a name for these machines. They're beyond bob-jobs—basically proto-choppers—and are the earliest form of the motorcycle as Art Object. Converting bikes into flamboyant statements of personality defined the cutting edge of cool in 1947, just as it does today.

Thus began the Fourth Age of Motorcycling, when performance took a back seat to aesthetics. The early birthto-toddler days of the mid-1800s to early 1900s was the age of Experiment, with new ideas hammered out in a thousand small workshops. The next age was Utility (post-1910), when motorcycles became reliable transport, not mere oddities. In developed economies, the age of utility was superseded as early as 1930 by the age of Pleasure, when inexpensive cars allowed bikes to be used as desired, not required. The unexpected flowering of the show bike in the 1940s proved a motorcycle could be admired solely for its beauty, with sculptural qualities outweighing questions of function.

The first hot-rod show, organized by Wally Parks in January 1948, included some far-out bikes: heavily chromed, painted up, stripped down. From that show forward, two- and four-wheeled customs immediately laid rubber, and both the Oakland Roadster Show and

Bonneville Speed Trials were on the calendar within months; motorcycling would never be the same. Show bikes grew increasingly unridden/unrideable in the 1950s, and the outlandish stretch of the chopper by the early '60s was undeniably about fashion over function. Before Easy Rider, one couldn't buy readymade chopper parts. "It was all about making stuff and no money," says Mike Vils, who worked for Ed Roth in '68. But that changed quickly with the global chopper craze of the '70s, which became a folk art industry.

In a 1998 Time column, art critic Robert Hughess called the custom bike "one of the distinctive forms of American folk art." But as late as 2011, Frederick Seidel asked in the New York Times, "Is the era of the motorcycle over?" The definitive "no" came from a groundswell of custom builders, with hyper-hip photographers and clothiers tagging along. Clever factories have hitched their stars to young builders, while going places an in-house design team simply can't.

A few builders have abandoned riding altogether and decamped into Fine Art. Pioneering gallerists in New York, LA, and Geneva have featured art bikes with million-dollar price tags; most have been no-sales, but one artist/builder did sell his soaring silver machine—formerly known as a Velocette, and likened by the LA Times to Brancusi's "Bird in Space" for well more than a half million. A new kind of race is afoot, with pedigreed design masterpieces (Brough SS100s and Series A Vincent twins) neck and neck with ambitious art bikes in the race up the money tree. History still has the advantage, but if any of the star juice smeared on the likes of Jeff Koons or Jean-Michel Basquiat touches a Chicara Nagata or Shinya Kimura or Ian Barry motorcycle, all bets are off.



BY THE NUMBERS

17

YEARS...SINCE THE JUNE 26, 1998 OPENING OF THE 'ART OF THE MOTORCYCLE' EXHIBIT AT THE GUGGENHEIM MUSEUM IN NY.

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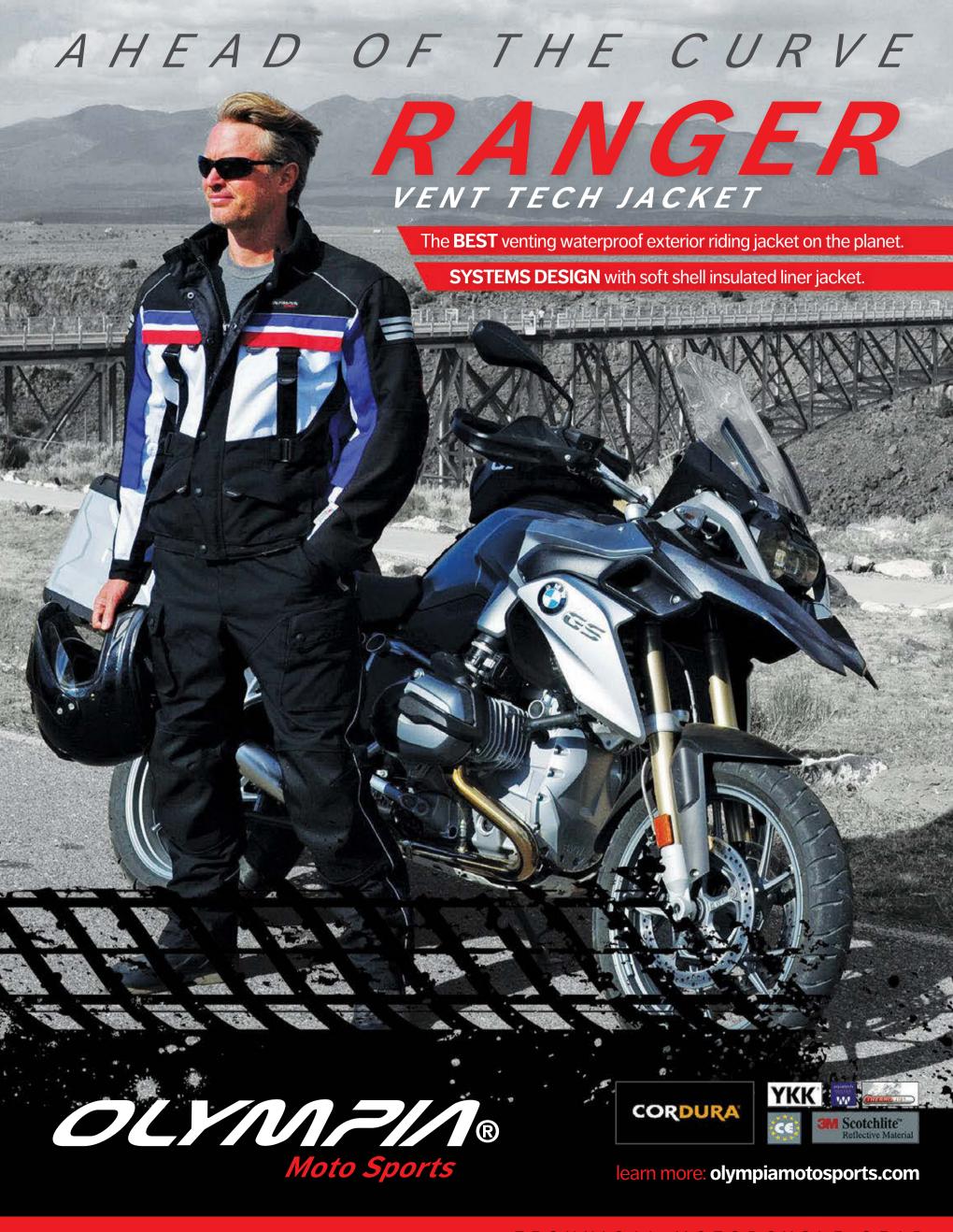
\$750,000

THE RETAIL PRICE OF IAN BARRY'S CUSTOM ART/MOTORCYCLE, THE WHITE, AT THE KOHN GALLERY IN LA IN 2013 (IT SOLD, FOR AN UNDISCLOSED SUM).

\$520,000

•••••

THE TOP AUCTION PRICE FOR A MOTORCYCLE, A 1915 CYCLONE BOARD TRACK RACER, IN 2009.



TEMPERATURE AND FAILURE

FROM THE STEAM ERA UNTIL TODAY, THEY'RE STILL RELATED

BY KEVIN CAMERON

otorcycle engines have cooling systems to keep critical parts from becoming hot enough to lose their properties and fail. Back in the Age of Steam, one of the most feared results was crown sheet failure. The crown sheet was the arched steel top of the firebox. Below the sheet was the intense, forced-draft coal fire, and above it (normally) was boiler water. Under pressure, boiler water was at a steady several hundred degrees, but even such hot water easily kept the crown sheet cool enough to retain adequate strength, especially since it was supported from above by numerous stay bolts. An alert engine crew monitored water level diligently.

If for any reason the water level fell near the crown sheet, solid coverage became episodic sloshing, and crown sheet temperature rose. If this continued, the crown sheet could soften, slowly deform, and then tear open, turning the boiler into a violent, fast-accelerating steam rocket, blowing it off the frame and catapulting it forward, sometimes coming to rest a quarter mile or more ahead of the train.

If a World War II B-29 bomber suffered an in-flight engine fire and fire bottles failed to contain it, the crew had 30 to 60 seconds to bail out before the flame broke through the thin stainless-steel firewall to play against the 2024 aluminum main wing spar. With aluminum alloys, significant loss of strength begins at just above boiling water temperature, 212 degrees Fahrenheit. The aluminum did not have to come even close to its melting point to fail by buckling, causing the aircraft to roll toward the failed side and enter a spin.

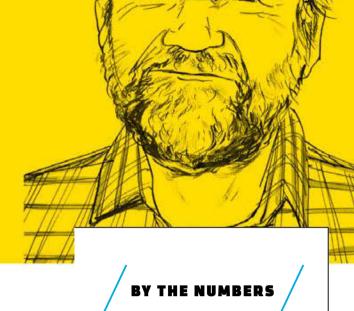
For the supersonic Concorde aircraft, which cruised at 1,330 mph, aerodynamic heating (air friction) required an aluminum airframe material having

high hot strength—a "Y-alloy" closely related to the cylinder head material in countless high-performance aircooled motorcycle engines. In this material, added nickel and copper form a hard intermetallic phase that retains strength at higher temperatures than conventional high-strength alloys, such as 7075. Right on the drawing for the heads of the legendary Vincent V-twin motorcycle it says, "Material: Y-alloy."

Even when heat-tolerant alloys are used, exposure to higher-than-planned temperature allows the part to slowly yield to stress in a process called "creep." Pressed-in valve-seat rings loosen; valve seats deform to become oval or to slowly move off center. Then the valve no longer makes large-area contact with its seat but touches it at only one or two points, losing most of its cooling. It grows hotter as hot exhaust gas leaks past it. The valve overheats and fails. This was common in military aircraft engines, but it is also not unheard of in air-cooled production motorcycle engines subjected to heavyduty use. Traditional motorcycle engines were designed by experience, so their cooling fin area was made adequate for the highway speeds of their time. Vintage machine owners who insist upon moving with freeway traffic can easily encounter head warping, unseated valves, and valve failure from over-temperature.

Classic air-cooled designs that remain in production today, such as Harley-Davidson V-twins and BMW flat-twins, now require "strategic cooling" to prevent the above maladies. Pumped oil or water is circulated through passages behind exhaust valve-seat areas to control their temperature.

When exhaust valves make full contact with their seats, modern valve materials are adequate for reliable function. As with temperature-tolerant aluminum alloys, valve steels benefit from the precipitation of super-hard



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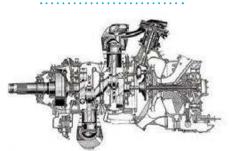
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DISTANCE IN CENTIMETERS
THAT THE CONCORDE
FUSELAGE IS SAID TO
INCREASE IN LENGTH AS
ITS AIRFRAME HEATED UP
DURING SUPERSONIC FLIGHT

1803

.....

YEAR THE FIRST STEAM LOCOMOTIVE WAS BUILT, BY RICHARD TREVITHICK. AS A CHILD IN CORNWALL, ENGLAND, TREVITHICK WAS DESCRIBED AS "DISOBEDIENT, SLOW, AND OBSTINATE," BY HIS SCHOOLMASTER



2,670

WEIGHT IN POUNDS OF THE 18-CYLINDER WRIGHT R-3350 RADIAL ENGINE, FOUR OF WHICH POWERED THE B-29 BOMBER

) CT

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phases within the material.

The motorcycle engine part that must tolerate the most destructive combination of extreme stress and temperature is the piston. The crown of the piston is exposed to the full fury of combustion, while the piston as a whole must withstand top dead center reversal stresses from thousands of times the acceleration of gravity. Even when made from modern developments of the original Y-alloy, pistons are vulnerable to any change in their operating parameters. Even a 5-degree Celsius rise in average temperature can cause a previously reliable piston design to fatigue crack and fail prematurely.

Tensile and bending stress on pistons increases as the square of rpm, so if development succeeds in finding 5 extra horsepower at a cost of raising peak power rpm by 250, that too can make a

previously reliable piston design old before its time.

Metals are a jumble of tiny crystals (sometimes referred to as grains), each one internally imperfect, joined together by chaotic inter-granular regions. Although metals can attain incredible strengths, we can understand why the late John Britten once said, "After working with directional materials (carbon fibers consisting of near-perfect crystals), I've become suspicious of metals and regard them as something like very tightly packed sand."

In an ideal material, all atom-to-atom bonds would be identical, carrying equal shares of applied stress. But in real metals—especially in their intergranular zones—atom-to-atom spacing varies, with stretched inter-atomic bonds carrying more stress and less-stretched ones carrying less. When we say a part

"AFTER WORKING WITH DIRECTIONAL **MATERIALS** (CARBON **FIBERS** CONSISTING OF NEAR-PERFECT **CRYSTALS**) I'VE BECOME **SUSPICIOUS OF METALS** AND REGARD THEM AS SOMETHING LIKE VERY TIGHTLY **PACKED** SAND."

-JOHN BRITTEN

is at 375 degrees Fahrenheit, that number is only an average, while individual thermally vibrating atoms may from moment to moment have more or less than the average energy. Maybe enough more—if its bonds to neighboring atoms are under great strain—to break those bonds. Raising the average energy of the part (its temperature) even a little bit makes such bond breaking more likely. This process leads by degrees to actual cracking.

Metallurgists seek to strengthen metals and equalize the stresses carried by all atomic bonds. Designers use dynamic Finite Element Analysis to reveal the pattern of stresses that results during piston reversal at TDC and then seek shapes that can reduce any concentrations of stress. Cooling oil jets are directed at the undersides of piston domes. Progress is achieved but gradually. **T**























One

of the motorcycle's best qualities is its ability to trigger your mind to build a pleasing image around the machine. For this pair of Scramblers, one from Ducati and one from Triumph, the image is idyllically rustic, backlit with hazy-warm golden light complete with lens flares. Much like the cozy crossgenerational visions you're looking at on these pages now. These are images evocative of times and feelings that may or may not have actually existed, though if you ask a riding enthusiast who lived and loved through the scrambler heyday of the '60s and '70s, there's no doubt it was real.

And there is no doubt it is real right now, on the highways and dirt roads of America. Good times, accessible motorcycles, and decent pricing are what fueled the boom times first time around, and both of these Scramblers offer a lot of bike for the money.

Step one to good times was sending our pair of pro-racer photo models for a real scramble in the California desert near Pioneer Town, not far from Joshua Tree National Park in California. Ryan Dudek's skills are well documented in these pages, and he was joined by AMA Pro SuperSport East champ Hayden Gillim. That's Hayden on the Ducati (p. 51),



THE TRIUMPH HAS THAT ALMOST EXCLUSIVELY ENGLISH PROPERTY





dragging a footpeg while dirt-tracking on a dry lake bed. It was totally impractical and all about fun, but if you happen to be a pro-level rider and want to slide one of these bikes on dirt, both of our guys picked the agile, light, and quick Ducati.

But back to reality.

Triumph came to this retro-scrambler land first, way back in 2005 (if you don't count pre-unit and unit-construction scramblers it made during the company's first life). If you missed it, the Scrambler is based on the love-object Bonneville, which I first rode on its introduction in England in 2001, when the weather forecast was so bad that the lady on the telly said, "Don't leave your homes!" Could have used the Scramblers' Bridgestone Trail Wings on that ride back then.

We didn't have any such weather troubles even though it was "winter" out here in Southern California. Sunny and warm, just like the personalities of these great bikes.

That said, the Triumph has that almost exclusively English property of being stylish and elegant while also getting its

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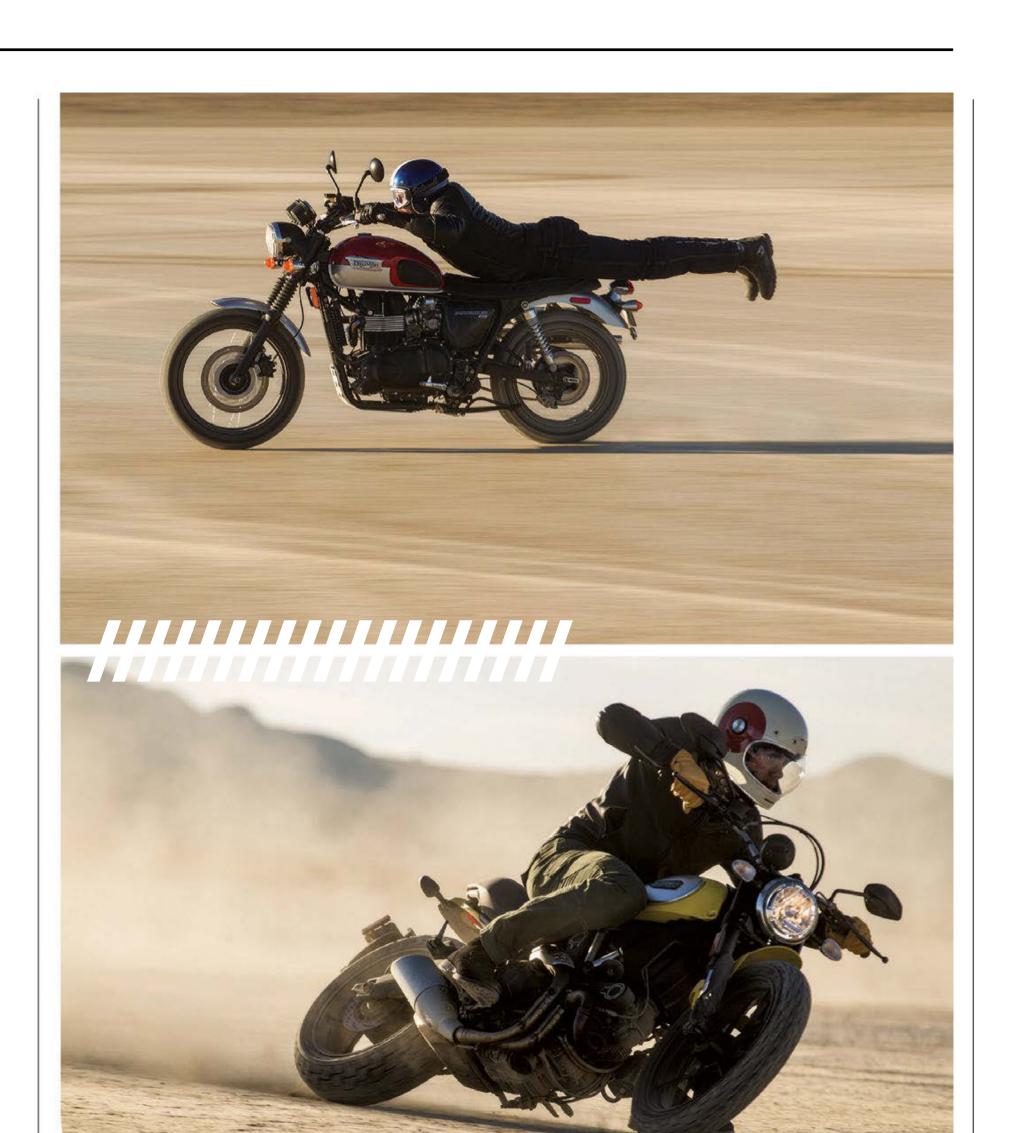
BIKE		DUCATI SCRAMBLER ICON	TRIUMPH SCRAMBLER
Price	€	\$8595	\$9099
Dry weight	₽	393 lb.	499 lb.
Wheelbase	Ð	56.9 in.	59.4 in.
Seat height	Ð	30.8 in.	31.4 in.
Fuel mileage	Ð	43 mpg	44 mpg
1/4 mile	Ð	12.02 sec. @ 109.35 mph	13.76 sec. @ 95.18 mph
0-60 mph	Ð	3.4 sec.	4.8 sec.
Top gear, 40-60 mph	Ð	3.9 sec.	4.9 sec.
Top gear, 60-80 mph	Ð	4.2 sec.	6.4 sec.
Top speed	€	120 mph	109 mph
Horsepower	€	69.7 hp @ 8220 rpm	51.6 hp @ 6620 rpm
Torque	Ð	46.9 lbft. @ 5570 rpm	46.2 lbft. @ 2810 rpm
Braking, 30-0 mph	€	30 ft.	35 ft.
Braking, 60-0 mph	€	123 ft.	143 ft.

frump on a bit. This latter point comes mostly from the basic "thickness" of the bike, both in its width from the highmount pipes and from the shape of the fuel tank and engine. Its weight and power output also give it some of that staid character. If you haven't picked up

106 pounds in a while, give it a go and ask yourself if you'd like to not have to lift it. Better yet, try running with that load. One hundred and six pounds is how much more the Triumph weighs than Ducati's exceptionally light Scrambler Icon, and you feel that difference in every



IF YOU ARE A PRO-LEVEL RIDER AND WANT TO SLIDE ONE OF



THESE BIKES ON DIRT, BOTH OF OUR PHOTO GUYS PICKED THE DUCATI.

movement of these bikes.

The power situation is also decidedly skewed: The Triumph's 51.6 hp from its 865cc parallel twin is delivered in measured fashion, thanks to the abundant flywheel inertia and bottomend-centric power delivery. Its 46.2 pound-foot torque peak is essentially equal to that of the 803cc V-twin Ducati, but it's delivered at 2,800 rpm, where the Duc's peak is at 5,570. That's it in a nutshell, but I'd be remiss not to point out the Ducati revs to 9K, 1,000 rpm higher, and belts out 69.7 vigorous horsepower along the way. It's a completely different tuning ethic at work.

To the Triumph's credit, it is exceptionally easy to launch, thanks to its torque character, smooth throttle response, and lighter-pull clutch.

But there will be no power wheelies. This helps make the bike a friendly commuter, and its time-travel nature is accentuated by a pair of "carburetors" that house the fuel injectors. There is even a manual fast-idle pull-knob down on those carb-like things. It's quaint and way cleaner than tickling an Amal Concentric. If you've never done that and want to experience it, every time you start your bike cold, go dip your finger in gasoline and pour some on the back of the engine so it drips onto the ground. Then pull the plug wires off and push the starter button until the battery dies, reconnect the plug wires, then pushstart the bike. If you're lucky. Breathe more gasoline fumes. That's a roughly accurate approximation.

But this modern British Scrambler starts great every time, leaks no oil, and feels wonderful to ride. When Senior Editor Blake Conner and I hit the road for testing—with a quick foray onto dirt roads in the local national forest—we both liked the ergonomics of the Triumph better. Its seat is flatter, the handlebar is farther forward, and there is generally more room for a bigger 6-foot-2 guy like me, but even my 5-foot-11 cohort was happier. The softer suspension was more compliant, but once the pace heated up the Triumph wallowed during sporty cornering.

No such worries on the Ducati. It was rock solid and leans a long, long way before a footpeg will touch the road. Its ride is much firmer and more precise

TIME SCRAMBLE

How the original Ducati Scrambler put Dave Despain on a Matchless

→ Ducati's reintroduction of the Scrambler takes me back to my motorcycling youth. In Fairfield, lowa, at the height of the Vietnam War, the local college made a huge (if shortlived) business out of providing student draft deferments to rich Ivy League drop-outs. Those "college Joes," as we derisively called them, were especially fond of Honda Scramblers. For us Fairfield homeboys (whom the "loes," with equal disdain, called "townies"), that was good reason *never* to buy one.

The alternative was the original Ducati Scrambler, which local dealer Duke Schmidt enthusiastically sold to a dozen or so CL72-averse townies determined to embarrass the Joes come Sunday at the local scrambles track. Those sales helped put Duke's Cycle Sales

on the map (Duke's recently celebrated 50 years at the same location!), and in a commentary on the mid-1960s motorcycle economy, they also helped make Duke one of the year's top 10 dealers of the Berliner Motor Corporation line. Berliner imported Benelli, Ducati, Matchless, and Norton, and Duke's "prize" for outstanding salesmanship was the opportunity to add to his floor plan one of the few Matchless G85CS Scramblers ever built.

The extent this was actually an honor depends on one's bias. Said a Bonham's auction blurb for a '65 G85CS: "Less than 200 were built for sale but thus mounted, Vic Eastwood, Chris Horsfield, and Dave Nicoll enjoyed many successes." In contrast, vintage racebike expert Tom White said, "With a \$1,400 retail price [almost

double that of its competitors], the last-ditch Matchless G85CS would be a complete failure in both sales and racing."

So I ended up not on a Ducati Scrambler but as the clueless owner of Duke's Matchless. How clueless? Well. I decided to make the bike a shorttracker and "broke it in" on the circular, living-room-size "test track" behind the shop, around which we townies careened with wild abandon, them on their Ducati Scramblers and me on my Matchless, the bikes constantly laid over hard left. That's how I discovered that the G85's oil-pump pickup was perched high in the *right*-hand side of the crankcase! I'm confident my G85CS owns the model record for the shortest life span of the original main bearings.

-Dave Despain

than the Triumph's but was nonetheless comfortable and not harsh.

Based on the ergonomics, Ducati is clearly trying to make this an easyaccess motorcycle for smaller riders and to inspire those of less experience. Its light weight and narrowness are great in this respect and are even great for full-size guys like me. But the seat basically appears to have had most of its foam scooped out to lower its height, and the tall, swept-back bar (as if borrowed from a '68 Yamaha DT-1, minus the crossbar) jams up taller riders. When you also factor in the high footpegs, you are looking at an uncomfortable riding position for anybody taller than about 5-foot-10.

Ergonomics are pretty easy to change, though, and the other Scrambler models

like the Full Throttle have a lower handlebar. So maybe there is some relief there.

The rest of the Scrambler Icon's ride is pure Ducati sporty naked fun with a whole lot of *wheee*! The engine is lively and quick revving, pulling strong all the way to the rev limiter. In fact, it's usually a surprise when you hit the limiter because there is no sign of power tapering off (and the LCD tachometer is hard to read at a glance). With its lighter weight, stronger engine, and more planted chassis, the Ducati rules winding roads. Add in much better brakes front and rear (with ABS standard) and the sporty package is complete. Not only are brake feel and front-end feedback significantly better on the Ducati, but its braking performance from 60 mph is 20



THE REAL POWER OF THE NEW DUCATI SCRAMBLER IS THAT IT WILL

DUCATI SCRAMBLER ICON

UPS

- •Impossibly cooler than any other Ducati
- •Sub-400 pounds!
- •The flat-tracker's choice

DOWNS

- •Riding position cramped for big folks
- Please put foam in the seat
- •Found a few false neutrals



- •The modern original
 •270-degree crank for sweet
- •So comfortable

sounds

- So porky
- •Time to get more power
- •And a brake upgrade, please

feet shorter (143 versus 123) than the Triumph's.

So in both numbers and feel, the performance choice is the Ducati. But one real drawback to the Italian bike's eagerness was its very quick throttle response and heavier-pull, lower-feel clutch. If you are at all unsure about your throttle control and clutch coordination skills, the Ducati can challenge your ability to be smooth. This is less a flaw than a matter of tuning style, but it's a real thing.

As we got more miles under our belt and felt like we'd explored the faster end of the performance spectrum, we backed off the pace a bit and focused more on riding away from our troubles and taking in the scenery. The nonadjustable fork and preload-adjustable-only shocks (two on the Triumph, one on the Ducati) began to matter less. The sounds and smells of the bikes, working as our accomplices in escape, came to the fore, the pleasing beat of the Ducati with its more distinct boom generally making most testers a little sonically happier.

The softer setup of the Triumph became a benefit, particularly when we headed up a bumpy fire road. While the pro riders on our photo shoot liked the Ducati for its speed, firmness, and agility, for a couple of dudes wandering around on a dirt road, the Triumph was our pick. At a mellow pace, its cushy nature helped it glide over chop that punished the Ducati rider and sent him looking for smooth tarmac once again.

But very few people actually will scramble these Scramblers. So?

Triumph gets the credit for (re)treading this chunky-tired path first in modern times and for building a bike that fits a big fella like me (and testers of most sizes) comfortably. It was also more relaxing to ride, thanks to its mellower engine response, easy-pull clutch, and softer suspension. Because of this, the Triumph would make a better starter bike, but the 106-pound heavier weight and awkward width due to those cool high-mount exhaust pipes are a couple of big strikes against it. And they're noticeable even if you're not a beginner.

The Ducati comes in lighter and leaner and \$500 cheaper (for our yellow Icon; red is \$100 cheaper still). For this money, you get a bike that is basically as sporty as a Monster but with a more laid-back personality. It's just about as easy to relax on while offering a lot more performance headroom. Even if its suspension is a bit stiff for bumpy dirt roads, the bike is ultimately truer to the scrambler ethic, both in image and performance numbers, freeing both your mind and your body just a little bit more.

The real power of the new Ducati Scrambler is that it will evoke a feeling of longing and nostalgia 20 years from now, and anybody who's ridden the bike will know just how real it is.



EVOKE A FEELING OF LONGING AND NOSTALGIA 20 YEARS FROM NOW.





hen the KTM 1290 Super Duke R concept was first shown at EICMA in 2012, we couldn't believe our eyes. At the time, it seemed so over the top as to be almost absurd. But now, after having lived with a Super Duke R for more than a year—and also having logged serious miles on two versions of the 1190 Adventure—stuffing the 1,301cc twin into the brand-new 1290 Super Adventure makes complete sense.

How so? With one of the very best electronic packages in all of motorcycling, the Super Adventure can be anything you want it to be. Mile-eating tourer? No problem. Roost-chucking adventurer? Yep. Wheelie-crazed hooligan? Yeah, that too. With engine—and now suspension management so advanced, there is no such thing as too much horsepower. A couple of quick flicks through the onboard menu, and the Super ADV can be as tame as a kitten or as fearsome as a tiger. But that super-size V-twin is only part of the news with this bike; it has a whole lot of other features that are just as notable, though none of them gets your attention in quite the same way as its engine.

The Super ADV's standout features include: semi-active WP suspension, cruise control, heated rider seat and pillion, LED cornering lights, electronic engine-braking control (called MSR: Motor Slip Regulation), and Hill Hold Control (HHC). Not only are these new to KTM's Adventure range, but also they are a first for the Austrian company in general.

Before I tell you how the new KTM Super Adventure was to ride, let's take a closer look at some of these features. Most significant is the WP suspension, which has a 48mm fork and a monoshock that are electronically controlled by the bike's suspension control unit (SCU). This happens in real time based on information from stroke sensors on each unit and a pair of accelerometers front and rear. The SCU applies damping changes instantly and constantly to maintain the desired preferences selected by the rider in the menu, with Comfort, Street, Sport, and Off-road options. These selections are totally independent of the bike's similarly named ride modes. Rear preload can be set via a menu in the computer, while the SCU automatically adjusts damping depending on the load and weight distribution readings it takes from the sensors.



While on the subject of electronic wizardry, KTM's MSR is an electronic means of limiting compression braking to the rear wheel and helping the slipper clutch keep the bike stable under hard braking while downshifting, by cracking open the throttle butterflies slightly to reduce load. Since the stability control system knows the bike's lean angle, this is taken into account as well. Hill Hold Control, another new feature. keeps the Super Adventure from rolling backward on inclines by automatically applying the brakes for five seconds when the ECU senses the vehicle is on a hill, all without the rider having to be on the brake. If the rider hasn't started to move forward after five seconds, the brake pressure is slowly released, but if the rider wants HHC to re-engage, all he needs to do is reapply the brake to start the cycle over again. This should make getaways a snap when you have a passenger and fully loaded bags.

Another cool feature: two LED arrays built into the leading edge of the fairing. These are not auxiliary lights in the traditional sense; they illuminate only when the bike is banked over. The three LEDs on both sides are aimed at different angles, and they light up in sequence as the Super Adventure reaches different lean angles. At 10 degrees, a single LED lights up, followed by the second at 20 degrees and then all three at 30. This is designed to dramatically improve lighting on a twisty road at night by filling in the void when your leaning motorcycle's headlamp is pointed off the road at

places you really don't want to end up.

Back to the one thing that makes the KTM Super Adventure such an E-ticket ride: its engine. Although sharing many components with the 1290 Super Duke R powerplant, such as the cylinders, connecting rods, and pistons, the crankshaft's flywheel mass has been increased by 4.4 pounds for improved bottom-end tractability. The cylinder heads and camshafts are also different. Additionally, the ECU tuning is unique, sharing nothing with the naked bike. KTM engineers fine-tuned this engine to give it a powerband that's more suitable for a luxury adventure-tourer than a complete nutcase like the Super Duke R, the latter of which made 151.6 hp and 93.3 pound-feet of peak torque on the Cycle World dyno. We expect the Super Adventure to produce comparable torque figures, a broader powerband, and slightly less horsepower at the peak of the rev range.

The press introduction and ride for the new Super Adventure took place

on Gran Canaria, the second largest island in the archipelago off the coast of northwest Africa. This felt appropriate because I had ridden the 1190 Adventure on neighboring Tenerife for the first time two years ago. It was after riding that bike that I returned and told the rest of the *Cycle World* staff that the 1190 might just be the single best all-around motorcycle ever made. Now, though, after spending two days exploring the inner island's vast wealth of twisty roads, I have to say that this new bike trumps the 1190.

The first thing you must know about the Super Adventure is this: It possesses almost a diabolical amount of performance. Despite all of the amazing electronics put in place to save your butt when you can't restrain yourself, it's still an animal of the most predatory nature. To get a true sense of what lies underneath the layers of intervention, I shut off the TC completely, which also happens to allow the bike to wheelie undeterred. As we headed up into the mountains at a brisk pace, I quickly discovered what a nasty (in a good way) machine KTM has built. Like the Super Duke R that preceded it, the Super Adventure produces instant and amazing acceleration. The front tire just skims the road surface at times or occasionally snaps into huge wheelies. This is truly amazing when you consider how composed the Super Adventure is when all of its electronic systems are on.

Scrolling through the ride modes during my two days of riding, I can assure you this KTM can act as tame and smooth as a Gold Wing, able to adjust its power to levels that give the rider massive confidence on slick or wet roads. And in Off-road mode, the rider can hang out the rear like he's on a giant dirt bike with the benefit of TC. When Sport mode is selected and TC is enabled,







the Super Adventure provides the rider with just the right safety net, boosting confidence and safety.

All of these systems work so effectively together that it makes me think the KTM Super Adventure might just be the perfect single bike for almost any type of riding. As with the Super Duke R, the Super Adventure has power everywhere, but what's most notable is the low-end torque. This will be most appreciated when moving away from a stop on a bike loaded with a passenger, luggage, and a full 8 gallons of fuel (two more than the 1190).

Adding to KTM's growing list of electronic management is the Super ADV's new semi-active suspension. Along with the bike's industry-leading ABS and Motorcycle Stability Control system, the suspension adds another layer of safety that is all but invisible to the rider, whether riding fast on a twisty road or just touring along the highway. Once the rider has selected the suspension mode, the WP units constantly monitor inputs from every integrated system to provide optimal damping balance. Never on any occasion did I feel the big Super Adventure wallow or feel like it had less than optimal damping for the situation. Chassis balance front to rear always felt excellent, and ride quality was easily selectable: plush or firm.

One of the fork's side benefits—which I tested in a most extreme way—is its anti-dive function. In Comfort or Street mode, the fork instantly stiffens under hard braking to keep the forward weight shift from bottoming the suspension, which should keep your passenger

happy on sporty rides. But for those riders who prefer a bit of natural dive to help the bike steer through tight corners, Sport mode allows just that. The system reacts so instantaneously that I could feel it making adjustments as I crossed over small sections of rough, broken pavement. On other occasions, I was amazed at how quickly the bike added compression damping after a wheelie had been set down.

Of the other new features, HHC is a standout. It worked exactly as advertised, and it will take away some of the frustrations of riding with a passenger. It was a bit more difficult to sense the effectiveness of the electronic compression braking control, most likely because the engine already has a well-set-up slipper clutch and the electronic element is so transparent in function. The LED cornering lights are a simple and effective solution for lighting up sections of corners that are not normally covered by a high- or low-beam headlight.

Ergonomically, the new KTM Super Adventure has taken a big step forward. The new seats, with individual heat controls for rider and passenger, are very supportive and comfortable. After a long day in the saddle, I felt totally fresh and could have spent substantially more time riding. Another big factor contributing to rider comfort is the manually adjustable touring windshield. There's good range of height adjustment to allow the rider to find a buffet-free pocket of air. My only complaint is that the thick upper edge of the windshield would distort my view into corners on really twisty roads.

One of our complaints against the standard KTM 1190 Adventure is that it lacks the creature comforts and features of the BMW R1200GS/Adventure. With the introduction of the new Super Adventure, KTM has addressed those shortcomings, building a bike that will peel the paint off its German rival from the north and enter into the same hyper-performance realm as Ducati's Multistrada. At \$20,499 (including bags), the 2015 KTM 1290 Super Adventure is definitely the company's flagship, a premium offering that still undercuts the Bavarian boxer significantly when optioned similarly.

So, as absurd as this bike might have seemed originally, KTM has succeeded in convincing me that the new Super Adventure is exactly the nasty machine the ADV market needs.



Phillip Habsburg

KTM'S HEAD OF R&D GIVES US A SNEAK PEEK BEHIND THE ORANGE CURTAIN

Story and Photos by Brian Catterson



With the recent acquisition of Husqvarna, a fledgling electric-bike program, and new lightweight streetbikes built in cooperation with Bajaj in India, KTM's R&D department is hopping! Some 330 people are currently employed in the division, and that number is expected to grow to 400 now that it has added another floor to the building. On a recent visit to the factory in Austria, we had a chance to meet with Phillip Habsburg, head of R&D, and hear what the future holds.

WHAT WE SEE FOR HUSQVARNA IS TO ATTRACT A DIFFERENT KIND **OF CUSTOMER.** We know that in some countries KTM has a market share of 50 to 70 percent, and we think we can attract some new customers who want to have another product with some Swedish heritage. The plan is to have both brands on the same platform; it's not feasible to have two completely separate motorcycles. In the past we made Husaberg more enduro-style, but with Husqvarna we decided to go more deeply into motocross and supercross. There the product will not be that different because the only thing that counts is lap times. It will be easier to see the differentiation on the street side. We showed the 701 Supermoto at EICMA, and there are two more Husqvarna streetbikes [the 401 Vitpilen and Svartpilen] that are a future vision of what we want to do.

WE ARE 100 PERCENT COMMITTED TO STEEL FRAMES. The problem with an aluminum frame is you need much more space, and you want to make an off-road bike as small and light as possible. We have five different off-road models with gas tanks ranging from 6 to

12 liters. If you go to an aluminum frame, it's almost impossible to create a big fuel tank in a normal shape. Another thing is flex is quite hard to get right. Development of a steel frame is also much easier. With aluminum you have different castings and machined pieces, and with steel you just cut the tube and weld it. You can make many different versions in a short



time, which makes it faster to develop new things for production.

ON THE ADVENTURE WE HAVE OFF-ROAD ABS, BUT WE WILL NOT SEE IT ON A COMPETITION BIKE FOR SOME

YEARS. In the off-road mode we switch off the rear completely, and the next problem is you cannot compare the wheel speeds front to rear. As for traction control, the main problem for off-road is there are so many different kinds of tracks—deep sand to very hard dirt. It's much easier to find the right setting on tarmac. Also it is quite tricky to have the right setting to

jump the bike because the front wheel leaves the ground before the rear. When it is introduced it will be through the sport [racing] department. One of our motocross teams is testing it already.

THE RC8 HASN'T BEEN UPDATED IN **A LONG TIME.** We are working on a replacement, but it will not be street-legal; it's not planned to race in World Superbike. For 2017, I think the RC8 will be built, and afterward there will be a track bike that we can offer to everybody, and there will be a limited version that meets MotoGP rules. We are already competing in Moto3, and the plan would be to have the same concept for MotoGP where there will be some teams that can rent the bikes.

THE FREERIDE E IS OUR FIRST
ELECTRIC BIKE, AND THERE WILL
BE A LOT MORE TO COME. We are
working on some different
models with different
capacities and also for the
street. It's expected that by
2050, 70 to 80 percent of the
world's population will live
in huge cities, so we need this
kind of urban mobility. Also
in China and some places in

Europe they have these city bans where it's not allowed to go inside with an internalcombustion engine. Also in Europe it's forbidden many places to ride off road, and the one thing that we want to do with the Freeride E is to bring off-road riding closer to the cities.



STEEL IS REAL: Although KTM says steel frames are right for its bikes, aluminum prototypes are still being studied.

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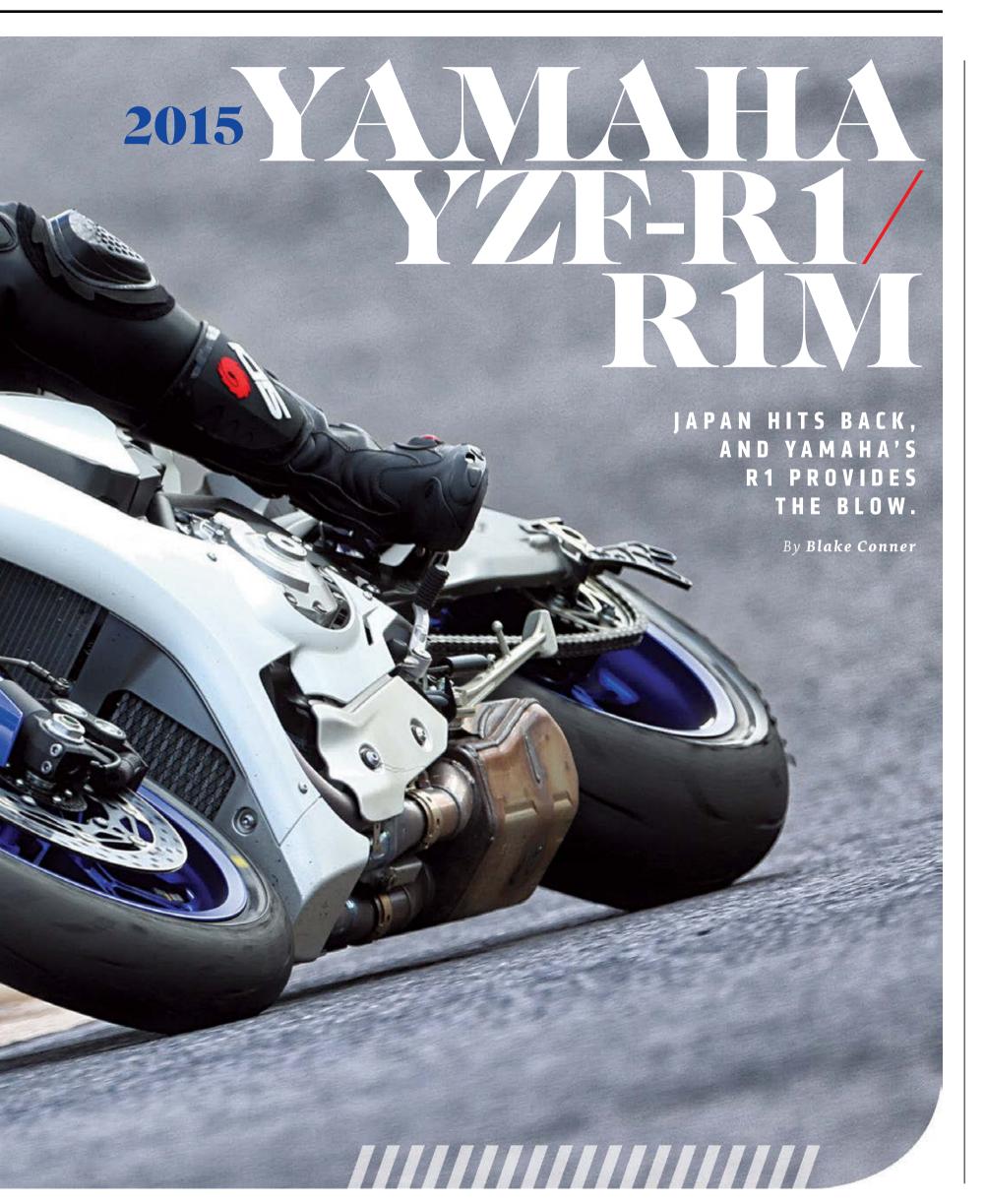
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Japan has finally hit back and hit back hard. After falling behind European manufacturers such as BMW, Ducati, and KTM in the electronics war, Yamaha has answered the call. The recession hit Japanese motorcycle companies the hardest, and they waited the longest to reinvest in sportbikes. But the wait is over. Yamaha has now introduced MotoGP technologies to the new YZF-R1 just a few short years after Lorenzo and company first utilized some of them. This has brought a whole new level of sophistication and refinement to the superbike-buying customer.

Make no mistake: The 2015 R1 is a game changer. Instead of making a great streetbike that was also capable of race-winning track performances, Yamaha designed this pair of brandnew machines to excel on the track first while also maintaining good street manners. What makes the R1 stand out isn't the brand-new engine, chassis, or styling. Rather, it's the outstanding electronics suite controlled by Yamaha's proprietary six-axis Inertial Measurement Unit that allows the rider to get the most out of the bike.

Our first ride on the R1 took place at Sydney Motorsports Park (a.k.a. Eastern





An intuitive rider interface allows all systems to be controlled via handlebar-mounted switches, while the informative TFT display lets you see exactly what modes you are in at all times.

Creek) in Australia. With so many electronic adjustments available, the combinations are practically endless. To get the most out of the six sessions planned for the day (three on the base model and three on the R1M), I focused on the basics: Traction Control System (TCS), Slide Control System (SCS), and Lift Control System (LIF, a.k.a. wheelie control) while leaving ABS and the Quick Shift System (QSS) in defaults for most of the sessions.

My first sessions were spent aboard the \$16,490 standard bike but fitted with Bridgestone's new RS10R supersportspec rubber in place of the bike's OEM RS10 fitment. To get a feel for the track in my first session, I toggled the bike's power mode to the second of four output settings. This mode allows full power with a slightly less abrupt throttle response. Then I selected TCS 4 of 9, LIF 3 (most intervention), and the SCS with the most intervention. While learning the track, the refined systems provided a mental safety net, but they're difficult to detect at a less-than-flat-out pace.

By my third session, I dialed back TCS to 1, LIF to 1, SCS to 2, and set power to mode 1 (full power, lively delivery). The effectiveness of traction control and slide control were much more apparent, the electronics allowing the power to be far more aggressively laid to the track. The wheelie control works very effectively; turning it down kept

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the front tire from going sky high but didn't kill too much drive onto the front straight. LIF is incredibly smooth, never abruptly cutting power to tame wheelies. It simply never allows the wheelie to float up too high in the first place, which means it never needs to disrupt chassis stability by slamming the front down. According to Yamaha's engineers, TCS, LIF, and SCS utilize fuel cuts, ignition retard, and throttle butterfly manipulation to achieve the desired result, which contributes to the precision and smoothness.

Once I had the track layout dialed, I was able to pick up the pace and get a feel for how potent the new engine is. With



a more aggressive and revvy nature, the crossplane-crank engine feels far racier—and way more powerful—than the previous-generation unit. But what impressed me the most is how well the entire package works together. The engine provides ample midrange to top-end power, allowing you to carry a gear taller through tight corners that might otherwise require an additional downshift. That usable and smooth power, together with the excellent leanangle-sensing electronics, gave me the confidence to get on the throttle much earlier and more assertively than my brain would typically allow. So seamless and refined are the TCS and SCS that it

only took a few sessions for me to place total faith in them.

The R1 is all about speed, which it delivers in huge doses, but its level of composure is amazing. I couldn't believe how relaxed I felt behind the windscreen at the top of fifth gear on the main straight. Thanks to a roomier new ergonomic layout (with a flatter seat and lower tank), great aerodynamics, and a taller more protective windscreen, the R1 cockpit is calm—even at 180 mph.

As amazing as the engine and electronics are, they are



THE R1 IS ALL ABOUT SPEED, WHICH IT DELIVERS IN HUGE DOSES, BUT ITS LEVEL OF COMPOSURE IS AMAZING.

backed by a chassis that is far more track-ready than any previous R1. The standard model's new KYB fork and shock provide excellent damping characteristics, and the fork's cockpitaccessible clickers and preload adjusters make quick work of refining your setup. On track, I was impressed with how light the bike felt and how flickable it was transitioning through the esses and into the ridiculously tight turn 11 hairpin. This agility is no doubt aided by the ultra-light magnesium wheels and a claimed wet weight of only 439 pounds. Front-end feel and midcorner stability also were excellent in hairpins or when wide-open through turn one.

Yamaha has always equipped R1s with excellent brakes, but this new system takes it to another level. The hardware has been upgraded with a new Nissin radial master cylinder, stainless-steel braided lines, and larger 320mm front discs pinched by four-piston radialmount calipers. But the R1 also has Yamaha's Unified Brake System (UBS) and ABS. For street riding, the linked, bank-angle-sensing system applies additional rear brake when the front is applied but not vice versa. At Eastern Creek, we rode with the optional Circuit ECU accessory that deactivates UBS and applies a very aggressive track ABS setting, which I found impossible to invoke on track. The brakes provided

YAMAHA YZF-R1

ENGINE TYPE

DISPLACEMENT

SEAT HEIGHT

FUEL CAPACITY

CLAIMED WET WEIGHT

PRICE \$16,490

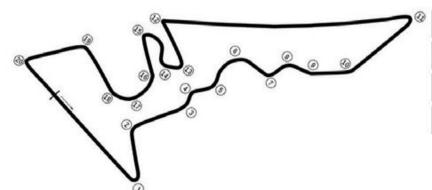


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This track, just outside of Sydney and formerly known as Eastern Creek, hosted the Australian Grand Prix from 1991 to '96 before the event returned to Phillip Island near Melbourne. During those six years, some of the biggest names the sport had ever seen grabbed victories there including: Wavne Rainey, Mick Doohan (twice). Kevin Schwantz, John Kocinski, and Loris Capirossi. While those races were held on the classic Gardner GP Circuit, a newer configuration called the Brabham Circuit now features seven additional corners, including the esses

into triple-digit speeds. **TURN 4: TURN 15: TURN 11:** A fast off-A big second-Getting into camber right gear 180 that TURN 2: the slowest over a brow opens slightly for This secondcorner on taken in second blackie-laying aear. decreasthe track tests grip. exits. ing-radius requires turn requires heavy traila late apex to brakina. set up for T3. section and turn 11 hairpin. **TURNS 6-9:** Second-gear esses test the bike's ability to flick from side to side.

TURN 1:

An incredibly fast

bend taken in

fourth gear deep

MAIN PIT LANE

powerful bite and were easy to modulate. That same Circuit ECU also eliminates the top-speed limiter and gives the slightly detuned-for-sound-emissions (190 versus 200 hp claimed) US models their mojo back. But FYI: It also kills the headlights, so you won't be tempted to use it on the street.

Our last three sessions were spent on the \$21,990 R1M. After convincing myself that the standard model could possibly be the best supersport bike currently available, I was in for a shocking surprise. It got better! For our sessions on the R1M, Bridgestone equipped our bikes with its Vo2 slick tires, which also required adding two teeth (43) to the rear sprocket to compensate for the rear slick's larger rolling radius.

After familiarizing myself with the available settings of the Öhlins Electronic Racing Suspension, I headed out for the first session. What I discovered is that the M takes the base R1's performance to a completely new level. With more grip than I could ever fully utilize, and Öhlins suspension doing all the thinking for me, all I had to do was concentrate on riding as fast as possible. After just a few laps, I felt totally confident in the "decisions" the Öhlins system makes in mere milliseconds. I tried the most aggressive and sporty (stiff) A-1 setting and then also sampled the slightly softer A-2. Both worked excellently, but for track use, on slicks, the A-1 provided better damping characteristics.

The R1 and R1M are amazingly complicated machines, but for all of their complexity and sophistication, they do a fantastic job of not making a big production out of it all. All of the systems work quietly in the background, allowing the rider to get on with the program and simply ride faster and safer than they've ever ridden before.

TURN 18:

The all-important

catapult onto the

180-mph front

straight.

That is perhaps what makes the R1 and R1M instant contenders for shootout wins: amazing performance, transparent electronic intervention, awesome comfort, great styling, all without being overly complicated. Yes, Japan is back in the sportbike game, and Yamaha intends to remind the Europeans that it knows a thing or two about class-leading technology. **LIII**

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concept of the frame, the engine, and how they work together. And we change how you build a twin, as it is not normal to have a twin with a 112mm bore."

Domenicali, who believes that a technical departure outside one's comfort zone is required to achieve significant progress, added: "We did it so radical because...we wanted to have a tool that was for us a platform to be competitive with the four-cylinder bikes."

The fix? An even larger 116mm piston resulting in an even more oversquare configuration displacing 1,285cc.
This, along with new rods, steel liners, and crankshaft (with precision steel balancing inserts), all fit within unaltered outer engine dimensions. Twin injectors per cylinder fuel the same elliptical 67mm equivalent throttle bodies with spent gas exiting through an all-new stainless-steel exhaust with larger-diameter tubes.

The result is an impressive 205 claimed horsepower (10 more than the 1199). Of even greater significance is the additional torque. Ducati says it's increased across the entire range,

with a 15-percent boost between 5,000 and 8,000 rpm. The chassis gets a half-degree reduction in rake (now 24 degrees) and a 4mm lower swingarm pivot. The restyled tailsection carries a more comfortable seat, while new grippier machined footpegs and a wider fairing with a 20mm-taller screen aim to improve rider comfort.

Of course, there has been further refinement of the electronics suite, which incorporates a Bosch Inertial Measurement Unit that monitors chassis motion in three axes. This has enabled a sophisticated Ducati Wheelie Control (DWC) feature as well as Cornering ABS. Another new feature is clutchless auto-blip downshifting.

The Ducati 1299 Panigale S model is equipped with Öhlins Smart EC suspension components featuring semiactive dynamic damping adjustment. Domenicali best describes the event-based suspension: "The funny thing about this is the system knows what you are doing. When you are braking, it's the best suspension for braking; when you are cornering, then it's the best

suspension for cornering. The image in my mind is that it's like having an Öhlins guy in your backpack continuously making changes with a screwdriver while you are riding on the racetrack."

Ducati staged a press test of the new machine at the Autódromo Internacional do Algarve Circuit, which is located in sunny southern Portugal. I spent the first of our five, 15-minute riding sessions getting reacquainted with the challenging 2.9-mile, 14-turn course, which is characterized by blind crests and abundant elevation change. The Sport ride mode proved ideal for this, allowing me to quickly and safely get up to speed following an out lap scrubbing in the fresh Pirelli Supercorsa SC2 race tires.

The default settings for DTC and DWC (both at level 5 of 8) witnessed very frequent electronic intervention



DUCATI 1299 PANIGALE S

ENGINE TYPE dohc 90° V-twin DISPLACEMENT

SEAT HEIGHT

FUEL CAPACITY
4.5 gal.

CLAIMED DRY WEIGHT

PRICE \$24,995



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INTELLIGENT TECH: Dashing TFT display sets the standard for form and function. Öhlins truly has it wired with its SMART EC fork, shock, and steering damper. Ducati CEO Claudio Domenicali possesses a strong engineering background and the riding skill to make the utmost of a rare day away from the office.





indicated by a yellow light on the top center of the dash. The effect was smooth and seamless, as was my initial reserved pace in an effort to simulate a fast street ride or trackday B Group. I found throttle pickup very fluid and the engine's electronically metered delivery linear, making this a bike many can safely experience. The chassis felt nicely composed at this pace as well, even with the Öhlins DES Smart EC settings at the Sport mode baseline, a street-oriented algorithm said to take overall ride comfort into consideration.

Prior to burning laps at a race pace in the later sessions, I explored Sport mode further by delving into the suspension menu (while parked on pit lane) and increased the fork and shock to a setting labeled "Hardest" of the five available options. I also reduced DTC and DWC to level 2 prior to entering the track. These settings greatly improved chassis feedback and unshackled the big twin, resulting in strengthened drive off apexes, even when I intentionally allowed revs to dip below 5,000 rpm midcorner. Wheelies felt uninhibited as well, the front coming up while the bike was still partially leaned over exiting an uphill second-gear right!

The hilltop that follows provided a few butt-pucker moments while I gained trust in DWC, the front pawing the sky and continuing upward as the road drops

"THE IMAGE IN MY MIND IS THAT IT'S LIKE HAVING AN ÖHLINS GUY IN YOUR BACKPACK

CONTINUOUSLY MAKING
CHANGES WITH A SCREWDRIVER WHILE YOU ARE
RIDING ON THE RACETRACK."

sharply away down the backside of the hill. The experience was reminiscent of my earliest encounters with ABS and traction control systems. Soon enough, my right wrist was undeterred.

The firmed-up suspension proved more to my liking, offering a significant improvement in feedback along with added resistance to fork dive under braking, the latter particularly appreciated in the downhill braking zone at the end of the fast main straight. The DQS auto-blip function eases rider workload when charging into such corners, producing silky smooth downshifts as the ride-by-wire system matches engine revs with each toe of the shift lever.

With myriad setup possibilities and limited time to experiment, I spent the remaining track time in Race mode, which most notably provides track-based suspension algorithms and also makes use of the Superleggera-style up/down

paddle switch on the left handlebar for on-the-fly adjustment of DTC, DWC, or EBC (engine-braking control) level. The paddle only functions in race mode and is limited to controlling one pre-selected parameter. Having determined DWC 2 and EBC 2 settings to be to my liking, I left DTC assigned to the paddle.

Throughout the day I ran ABS level 2, which provides the new Cornering ABS function along with rear antilock/anti-lift control. ABS level 1 is a track mode that disables the cornering and rear ABS features.

I didn't get around to trying level 1 because, quite honestly, I never once felt the front brake cycle either in a straight line or while trail braking. Perhaps when we have a testbike back home I will muster the courage to explore the system's deep lean capabilities...or convince a coworker to do it.

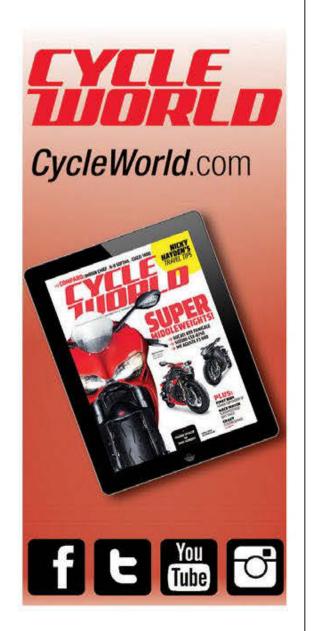
Just as BMW has applied performance technology first offered exclusively on the HP4 to the new 2015 S1000RR, so too has Ducati taken Superleggera bits and applied them to the 1299 Panigale.

Should Superleggera owners start weeping in their vino? No.

And they won't be getting an apology from Ducati's CEO, who added: "We see that the 1299 is the final refinement of this project."

Just goes to show that blessings do come to those who wait.







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By Ray Nierlich

Dylan Hoffman's Suzuki uses the same oil for the engine, gearbox, and clutch. Even if his oil looks this clean, acids that build up over time make regular changes necessary.

HELMET DESTRUCTION PARTY?

Do you have any ideas for disposing of used helmets? I have a large collection, some crashed but most not. The helmets are out of date and should not be used. Short of a Sawzall and a few blades, any thoughts or suggestions would be helpful.

BILL CRAMER CLEVELAND, OH

Call the Bonhams auction house immediately. You won't believe what some guys will plunk down for what looks to me like junk at a vintage bike auction. Spread rumors that perhaps Hailwood wore one of the helmets once. It sounds like you have the makings of a great "bash" party! Invite your biker friends to bring any old helmets to add to your pile. Kegger, couple of sledgehammers, lots of gloves and goggles, and maybe \$20 a swing donated to Ride for Kids.

HOT-START HARLEY

Davidson Road Glide. After the bike gets hot and I shut it off for a short time, it will not start easily. It's like the bike is flooded. If I keep cranking, it will eventually start. The shop says it is the nature of the beast and could not find anything wrong, but I think surely something can be done. When cold it cranks right up with no problems. What are your thoughts?

R. HELTON KNOXVILLE, TN

All Harleys since '07 are fuel injected. When an EFI engine heat soaks, it will go lean. A carbureted engine will go rich. Chances are your bike is going too lean. Hard hot restarting isn't a common complaint on late-model Harleys, so it is worth investigating further. If you go to a Harley dealer, they can hook your bike up to what Harley calls "digital tech" and scan it. This scan will tell them the position of the intake air sensor motor (idle speed stepper). Too small an opening means an air leak somewhere, resulting in a lean condition. If it is going lean, the most common cause is

a vacuum leak at the rubber seals on the intake collar. Replacing the seals is a simple job, so you could just pull the intake and replace these to rule them out as the problem.

CLUTCH OIL 101

I just picked myself a 1983
Suzuki GS1100G and tore it
down for the most part to check
that everything was in working order.
It's the first pre-2000s bike I've worked
on and the first bike I've ever owned.
I can't find anywhere that says how
much oil to put in the clutch. It's an
18-plate clutch, but I'm not sure if that
affects anything. I don't want to burn
out the clutch because it's only got
3,500 miles on it, so some help would be
greatly appreciated.

DYLAN HOFFMAN CYCLEWORLD.COM

First off, the manual calls for 3.2 quarts of oil when the filter is also changed, which you imply saying you "tore it down." I'd fill with a bit less than 3 quarts and check the sight glass on the lower right side of the engine. Like most modern bikes, your GS has a wet clutch and gear primary drive, meaning it is inside the cases and runs in the same oil that lubricates the engine and gearbox. The number of plates in a clutch doesn't have any relation as to whether it is wet or dry.

On bikes with a separate chain primary drive (modern Harley-Davidsons, most vintage British bikes), the idea is to try to keep the clutch as dry as possible while getting just enough lubrication for the chain and sprockets. When a true dry clutch is used, as on a lot of recent Ducati models, they work well and don't pollute the crankcase oil with fiber particles but can be noisy.

Whenever I put new friction plates in a wet-clutch engine, I soak the plates in a little of the oil I'm going to use for the engine. An old habit that probably isn't even necessary. The important bit is to remember to use motorcycle-specific oil that is suitable for wet clutches, not automotive oil which is too slippery because of the special friction reducers.



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BASIC SPECS: The YZF-R1 of the pre-YCCT (ride-by-wire) era is powered by a liquid-cooled, 998cc, DOHC inline-four. The Genesis engine features five valves per cylinder, EXUP-valve-equipped exhaust, and introduced a stacked gearbox. Yamaha made the switch from carburetors to fuel injection with the R1 throttle bodies employing a simplistic, yet very effective, CV-type flat-slide secondary throttle valve for smoother response. It produced 134 hp at 10,800 rpm on the *Cycle World* dyno and weighed 412 pounds without fuel.

WHY IT'S DESIRABLE: Yamaha's secondgeneration cat-eyed liter-class bike featured an updated Deltabox III frame and chassis based on the YZF-R7 superbike. This translated into agile handling backed with an abundance of mid- and top-end power. The 2004 model year brought an underseat exhaust, ram-air intake, radialmount brake calipers, steering damper, and fresh styling. While quite capable as a trackday weapon, the R1 was a top choice among its peers for general street duty.

THE COMPETITION: In 2002, Honda introduced a new CBR954RR, and while Suzuki's brutally powerful GSX-R1000 won CW's track shootout at the time, the R1 didn't disappoint. "It's the best-balanced of these three and a damn good streetbike, maybe the best for most back-road aces," we wrote. The 2004 debut of the Kawasaki ZX-10R rewrote the class rules with unmatched power and weight. Suzuki then countered with the significantly updated 2005 GSX-R1000, a bike still seen by many as the apex of Gixxer development.

GOT A MECHANICAL OR TECHNICAL PROBLEM with your beloved ride? Perhaps we can help. Contact us at cwservice@cycleworld.com with your questions. We cannot guarantee a reply to every inquiry.

LONG AND SHORT OF IT

I have a 2013 Harley-Davidson FLD Switchback. I have a touring seat and backrest for long rides and weekend trips with the wife plus a solo seat for when I take off the bags for cruising around town. The long muffler is ugly without the bags! Can I safely buy shorter pipes and interchange them with the different configurations? Will this affect engine performance or, worse, damage the engine?

PHIL CENCI STATEN ISLAND, NY

Go ahead and fit the pipe you like. Remember, your bike has a 2-into-1 exhaust. It isn't the length that is so important so much as the flow rates and noise levels. If backpressure is reduced with the new pipe, it will be best to remap the fuel mixture to match. If the mixture is leaned out, exhaust valve temperatures will go up some, possibly shortening their life very slightly. All fuel-injected engines made in the last 30 years have upgraded exhaust valve materials. These materials are to suit the higher combustion temps resulting from the leaner FI mixtures, so any shorter valve life may only be theoretical rather than observed. Buy something stylish from one of the aftermarket H-D suppliers or Harley's own Screamin' Eagle line and live it up.

LOWER YOUR CONC? NO!

I have a 2010 Kawasaki Concours 1400 that I bought new. I would like to lower the seat height (I have installed a Corbin seat, which has been reworked and lowered by approximately 3/4 inch.) I'm considering lowering links but am concerned about effects on performance of cornering and overall ride and handling. What can I expect? Any other recommendations to lower the bike would be appreciated.

RICHARD RICCIONI FARMINGTON, IL

My recommendation: Don't do it. Lower the bike only as a last resort, or buy a different bike.

After modifying the seat and buying thicker-soled boots, your only remaining option is to lower the chassis. If you install lowering links, you should drop the fork tubes in the triple clamps too.

Dropping the fork tubes requires fitting

TOOL TIME

NO-MAR CLASSIC TIRE CHANGER AND WHEEL BALANCER

→ How many thousands of tires has the CW staff changed on the Coats 220? You remember that machine, right? Every motorcycle shop had one. The Coats 220 is still for sale at \$1,295, but our 25-year-old unit has finally been retired...so to speak.

The significant difference is the mounting of the rim on the machine. Rather than metal clamps, the **NO-MAR CLASSIC** (nomartirechanger.com) holds the rim with plastic. More specifically, it's Ultra High Molecular Weight Polyethylene, a superlight and strong material. These pieces clamp the rim securely with a unique cam that takes only moments to tighten. No metal touches your rim.

The tolerances of the rim clamps are tight, and it takes a bit longer to fasten the wheel in place than it did on our Coats; the operator has to be sure the rim is pushed all the way into the two receiving clamps or it won't fit down into the plastic cam clamp. Our No-Mar came with an instructional DVD that showed us how to use our hip against the long tire iron and use our free hand to help keep the tire in the rim valley. Our Classic came with tire-mounting lube, a spray bottle, and No-Mar's bead-keeper. The plastic-covered bead-keeper



clamps on the rim and helps the changing process by not allowing the tire to rotate around the rim while leverage is applied.

We also sprung for the No-Mar balancing stand, a \$120 item that replaces our well-worn homemade balancer. We've balanced two sets of racetrack tires and are impressed with the ability to get the weight exactly right.

Having spent 25 years working our Coats 220, we were understandably slower on the No-Mar, but each change got easier. The biggest challenge was putting 190 Dunlop slicks

on a 5.5-inch-wide Yamaha rim, but the instructions helped and the job was done. We only swore twice.

We mounted our changer on a heavy wooden pallet, but there is a trailer-hitch mount if space is a concern. The system adjusts to wheel sizes of 10 to 21 inches and includes a bead breaker that works with the wheel sitting on top of the changer, giving the user adequate leverage to pop the bead into the rim valley.

The \$545 price might seem high, but the Classic is less than half the cost of a new manual Coats 220.

–Nick Ienatsch

bar risers on a Concours. Expect a max of about another inch of lowering, despite claims from suppliers purporting a greater amount. The sidestand and centerstand will need shortening too. These big and fast inline four-cylinder sport-tourers are wide of beam. When

something touches down unexpectedly in midcorner, it may well be a big piece of something important and solid. If you lower the bike, don't carry a passenger or excessive weight that would compress the suspension and reduce cornering clearance even more.

SHOWS

TIRE REPAIR IN THE STICKS

■ I live in Alaska, where just about any long trip takes you either to or through a remote area. This makes me worry about what I would do if I got a flat tire in such an area. I have a Motion Pro bead breaker/tire spoon tool with which I have succeeded in removing and replacing a tubeless tire on a practice rim lent me by the BMW dealer's service manager. (I am grateful. I would hate to do this for the first time in the middle of nowhere, and I did learn that I need at least one spoon longer than 11 inches.) My problem is that I doubt I would be able to reseat the bead using only a hand pump or 12-volt mini-compressor. The practice tire has a tube in it, so I haven't been able to try it without the tube.

My question: Should I just assume that I will need to use tubes, in which case I will have to remove the tire pressure sending units, or is there some other approach that will work? Is it possible that motorcycle tires reseat

much more easily than automotive tires? Would it make more sense to try to plug punctures without removing the tire, using rubber band-style plugs? If it makes any difference, the bike is a 2014 BMW R1200GS.

> **BOB REAGAN** CHUGIAK, AK

Don't know about you, Bob, but if I'm stuck in the middle of nowhere by myself, with maybe a bear eyeing me, the last thing I'm going to do is hang around to find out if he's hungry. First, unless you are carrying a spare tire, there's usually no reason to remove a punctured tubeless tire from the rim. A good plug kit like the Dynaplug (dynaplug.com; \$29.99-\$69.99) or Stop & Go Plug Gun (stopngo.com; \$49.95) hopefully will be all you need. Add a compact electric compressor or just carry plenty of CO2 cartridges to refill.

If the bead happens to come unseated, it can sometimes be helped back on by

using a ratcheting tie-down around the circumference of the tire and then attempting to inflate rapidly. You might even need to remove the valve core to let that CO₂ fly in there to first seat the bead. Then replace the core and inflate normally. We've even seen a few crazies seat a bead by squirting starting fluid inside the tire and lighting it off, but we can't recommend that unless you need to scare a bear away too! A spare tube to get you home if you can't otherwise plug or seat the bead in the field is a good idea too. Just be sure you can remove the factory stem. Channel Bud Ekins at the ISDT and practice dismounting and mounting that baby ahead of time.

MY OIL FILTERS LOOK DIFFERENT

I recently purchased an oil filter from the Triumph dealership, part #T1218001. When I got home I compared it with a new filter like the one used on my first oil change. The part number was T1210444. The

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first mentioned filter has six holes around the outer edge. The T1210444 has eight slightly smaller holes. I have read articles warning of aftermarket filters having inadequate flow properties. Both filters are genuine Triumph parts. The dealership says both will work. I can't find a part number listed in my owner's manual for a 2012 Triumph Bonneville T100. Am I okay using either filter?

RALPH DUNN NEW MATAMORAS, OH

Yes. Triumph only uses one oil filter for its entire range of bikes. Why other manufacturers don't do the same is beyond me. The T1210444 is an old number and the supersession is the T1218001. The number of holes in the filter doesn't matter—six larger or eight smaller—that's just different ways of accomplishing the same thing.

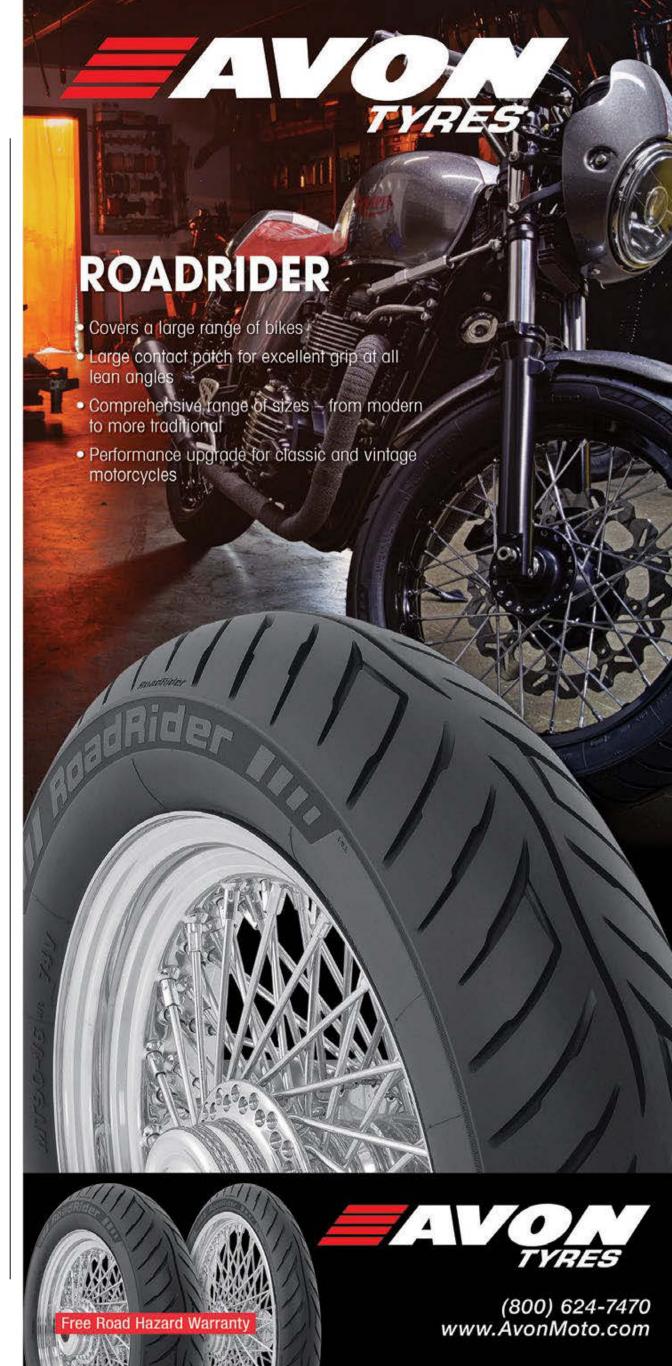
POOR PLUG LIFE

I recently bought a new 2014
Kawasaki Concours and was looking through the owner's manual, in particular the maintenance section. I saw that Kawasaki recommends the changing of spark plugs every 7,500 miles. I could not believe my eyes. Is this correct?
What are your thoughts? Surely our technology in all areas of the combustion engine has been able to produce plugs that will last longer than 7,500 miles. My Ford F-150 runs like a top with the original plugs at 59,000 miles.

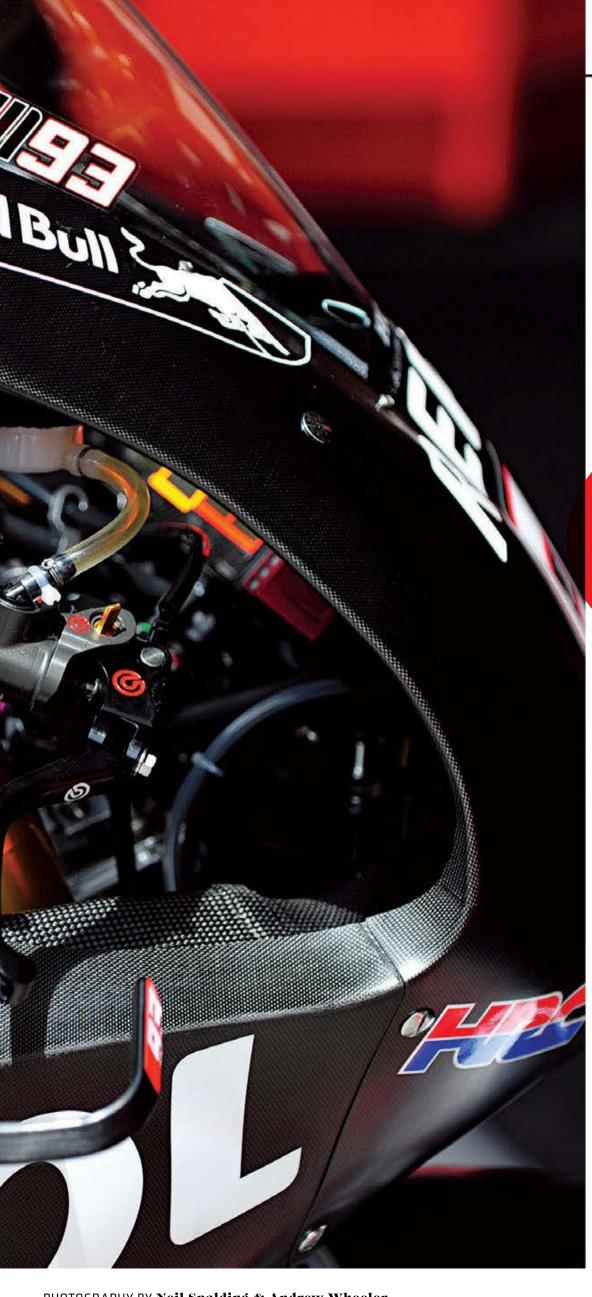
LARRY FISHER

CORPUS CHRISTI, TX

Kawasaki has decided that 7,500 miles is the optimum change interval. I doubt it's essential to change the spark plugs at exactly that mileage, but they won't last without noticeable wear until the recommended 15,000-mile valve adjustment, so it is logical to do them once in between. Your bike's engine is a virtual racehorse compared to that Ford F-150 plow horse. Larger operating temperature swings, higher cylinder pressures, and way more rpm dictate the plugs just don't last as long. The center electrode wears down in these tough conditions, even though your Concours 14 is fitted with NGK's best iridium-type plug.







PRIXVIEW MOTOGP 2015

Observing the off-season tests to see what MotoGP has in store for 2015 **By Neil Spalding**

he first two official MotoGP tests of 201<mark>5—Se</mark>pang I and II—saw a remarkable spread of bikes. There were completely new racebikes from Ducati and Suzuki, while Honda and Yamaha returned with developments of their existing machines. And Aprilia clearly had some ongoing problems. Here's a look at each manufacturer.

DUCATI

For 2015, Ducati has the new Desmosedici. and there are clear signs that the GP15 can be developed to compete at the top. Ducati hasn't won a MotoGP since 2010, after which Casey Stoner left for Honda and none of his replacements could put the continually changing bike up front. Progress since has been slow, but the 2014 bike was a big improvement. Testing confirmed it needed a repackaged engine and gearbox to get the forward weight distribution the tires needed for the best possible grip.

That new engine is here and remains a 1,000cc 90-degree V-4 with desmodromic valve actuation, but the V has been rotated farther back in the chassis. This allows the heavy crankshaft to move forward without the front cylinder head getting in the way of the front wheel. In addition, the water pump has been moved forward and is now driven off the front exhaust cam.

Until now, Ducati has used a "big bang" crankshaft design with crankpins offset by 70 degrees, concentrating all combustion events. Ducati has now decided to adopt a 360-degree crankshaft as used on some of the company's 800cc engines, for the smoothest possible power output, like Honda. Yet, like Yamaha (and a first for a V-4), Ducati has reversed its rotation







to make the bike roll over into corners a lot quicker (because the gyro effects of the forward-spinning wheels are now to some degree canceled by those of the backward-spinning crank).

Along with the engine, the GP15 has a new aluminum beam chassis and another version of Ducati's preferred carbon-fiber swingarm. The bike is noticeably narrower and shorter than the previous version with yet more new bodywork.

The bike turns quickly and stays on line where needed, and it improved on the times set by the previous GP14 even with a cautionary 1,000-rpm-lower rev limit. It's a great debut for a long-overdue redesign; we'll have to wait and see how it improves with more development.

HONDA

Marc Marquez is an impressive rider, and it's becoming apparent

that he uses a bike with a chassis that flexes more at full lean for additional grip. Dani Pedrosa and other Honda riders have found that additional flexibility difficult to deal with (last year Pedrosa preferred a chassis based on his 2013 bike). It is beginning to look as though this is all starting to cause some confusion, raising the question: Whose lead do you follow when designing your bikes?

Normally, you try to keep the choices faced by the top riders to a minimum. But at Sepang I, Honda's works riders had four bikes to try—their 2014 machines, the Brno and Valencia 2015 test bikes from 2014, and a model with a chassis similar to the 2015 prototype's but fitted with the wider 2014 seat and tank. Fitting these had required cutting off the new mounting lugs and welding on new brackets. Usually, the satellite bikes and works bikes

start this first session with the same equipment, but it's clear that something different is happening now. The satellite bikes of Cal Crutchlow and Scott Redding appeared similar to the original works prototypes but not at all like the Repsol bikes.

Honda wouldn't be making these changes if they weren't needed. The last time I saw parts of a bike being remounted in this fashion was in 2006, when Yamaha tried to solve a serious attack of chatter, which happens when vibration from one part of the bike excites another part with a similar frequency.

Stopping seems to be a problem too. Crutchlow said it was difficult to stop his Honda and Marquez blew an entire first day at Sepang II trying different brake setups. Last year, the Hondas could get away with 320mm carbon brake discs when everyone else needed 340s, yet now the

MOTOGP EYE CANDY:

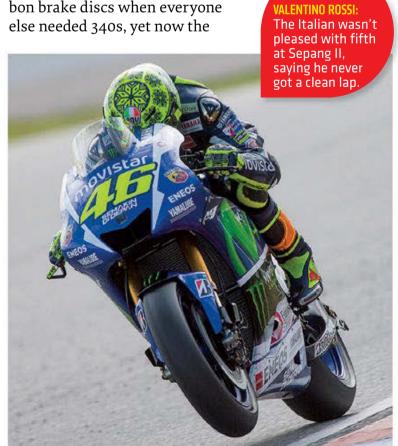
Suzuki, an underfunded effort compared to the other MotoGP players, uses Öhlins suspension, a proven commodity, for riders Maverick Viñales and Aleix Espargaró. Meanwhile, Yamaha keeps the big pebbles out in 2015 with new exhaust screens, while Honda keeps the welder busy making sure its 1,000cc V-4 race engines are properly scavenged.







FOR A TRACK I DISLIKE, THAT'S MY FASTEST-EVER LAP AROUND HERE BY NEARLY EIGHT-TENTHS OF A SECOND." –CAL CRUTCHLOW, LCR-HONDA, THIRD OUICKEST AT SEPANG II



340mm discs are only just good enough for Honda. Despite this, Honda has found a setting that allows Marquez to cut extremely quick laps when required.

YAMAHA

Most of the parts Yamaha brought to Sepang were first tested in Valencia last year. Both riders had the new "slash-cut" short exhaust pipes but now fitted with mesh to stop gravel going up the pipe in a crash—important when you only have five engines to last you for the year.

Valentino Rossi was particularly quick on the first day of testing. His bike had the new mainframe, with a reinforced "corrugated" section in the beams near the steering head for extra braking stability. Jorge Lorenzo used a carbon-fiber-reinforced version of the swingarm and clearly liked it. Rossi,

who prefers more flex, stayed on an all-aluminum version.

The Yamahas have new crankcases; the design is tidier, and there is a larger casing for the new six-speed gearbox, which now offers seamless downshifts for 2015. This was tested by the factory riders at Sepang II and given a cautious welcome. A well-set-up seamless transmission will make corner entry far smoother. It won't make a major difference in lap times on fresh tires, but it should help reduce tire wear and retain more grip for the last few laps.

SUZUKI

Suzuki has been testing for nearly two years, and the bike is finally ready to go. The engine is a forward-canted 1,000cc inline-four with a reverse-rotating crankshaft like the Yamahas'. The chassis, a conventional twin aluminum beam, turns into corners well. However, it has been criticized for insufficient rearwheel grip. Suzuki focused on that at Sepang, trying to improve





grip through shock and linkage adjustment without losing the front grip that has allowed the Japanese manufacturer to set some impressive times despite its clear power disadvantage.

Several Suzuki engines were broken during the end-of-2014 Valencia test with Aleix Espargaró and Maverick Viñales. The team managed the problem by backing off the throttle settings. By the end of the Sepang test, power was being increased again. A long-term fix is required, but Suzuki races under the "special dispensation" rules, which means it has 12 engines and the design isn't frozen at the first race.

APRILIA

Aprilia brought a pair of bikes for each of its riders at Sepang. One had the same chassis used in the Valencia test at the end of 2014; the other was completely new. The bikes were fitted with the pneumatic valve spring version of the RSV4 engine. Normally, a factory would do all its development in private, but Aprilia has

decided to race while developing the bike (the non-frozen engine design permits this).

The engine, with pneumatic valve springs, can potentially rev to 17,000 rpm, 1,500 rpm higher than the old ART engines. However, despite restricted rpm, three Aprilia engines broke in the first few days. The new bike, the RS-GP, turned out to be difficult, not turning in well and understeering. Finally, Marco Melandri says he can't find any "feel" in the tires, ending up four seconds off the leader and two behind teammate Alvaro Bautista.

There's not much time for Aprilia to figure it out because the 2015 MotoGP season kicks off Sunday, March 29 in Qatar.



THE SCOOP:

Suzuki has had reliability issues with its new inline-four in preseason testing, but the team is allowed to use 12 engines in 2015. Ducati's new GP15 has been fast, but we'll see if the speed can last a race distance. Meanwhile, Aprilia will continue developing its new RS-GP in public.





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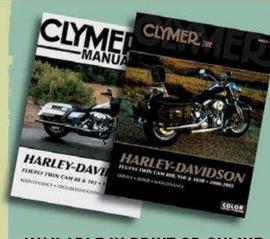
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Product Comparo: Bohn Armor Pants vs' Kevlar Jeans

ActionStations Boss Paul English talks about the differences in lower body protection options.

Kevlar reinforced jeans are popular with riders of all kinds of bikes.

Draggin Jeans were among the first on the market, and there are now many similar versions available.

Many riders are interested in how these compare to the Bohn Pants.



Q: Paul, please explain the differences between Kevlar riding Jeans and the Bohn Pants.

PE: In short kevlar has great abrasion resistance and is excellent for gravel rash when you're sliding down the road. With the Bohn System we're focusing more on Impact Protection - the vulnerable 'corners' you land on and damage - knees, hips, and elbows and shoulders with the shirts. An unprotected impact in these places can put you in the ER and off work. And hurts!

Q: But won't your armor grind through in a wreck?

PE: Actually in over 15 years, we've never seen our armor significantly damaged at all! This is because in a crash, we tend to bounce and slide, scrubbing the speed off.

Q:The Bohn System has to be worn under jeans as an extra layer, isn't that hot and a hassle?

PE: Positioning armor snugly against your body is the best way of providing comfortable and discrete protection so that it's in the right place if you have a fall. Yes, it's definitely an extra step compared to jeans - but on the other hand you can then wear your own jeans, or whatever pants you choose. It gives you a lot more options.

Q: But isn't it hot?

PE: The only time you notice the Bohn Pants being hot is in the heat of the summer when you're a standstill, say sitting on your bike at a light. At that time of year eveything's hot! Otherwise they breathe really well in all seasons; and we do have options of a mesh shell material and also a winter thermal solution.

Q: What about putting armor into kevlar jeans?

PE: Some companies do have this option, which on first impressions is a good idea. But what actually happens is the armor 'flops' around the outside of your leg as it's attached to the jeans - so you can imagine that it won't be in the right place if you actually do hit the ground.

Q: So do I need to upsize your jeans for the Bohn Pants?

PE: Surprisingly most people find that their existing regular-fit, or relaxed jeans fit perfectly over the Adventure Pants - that's because the armor mainly fits where your jeans are loose.

Q: Don't the Bohn Pants make your jeans look bulky?

PE: No one can see you have anything but your jeans on!

Q: And you make armored shirts too?

PE: We think of the pants and shirts as 'A System' that protects you without having to wear full armored gear - specially in the heat.

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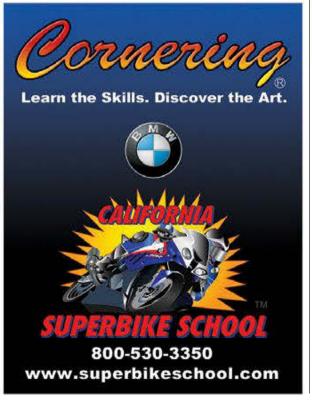
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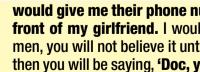
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